Town of Shandaken, New York

Repetitive Loss Area Analysis DRAFT

5-Year Update

July 2025

TETRA TECH

Town of Shandaken Repetitive Loss Area Analysis 5-Year Update

July 2025
#105s052513

PREPARED FOR

Client Name
Address Line 1
Address Line 2

PREPARED BY

Insert Entity
Insert Address Line 1
Insert Address Line 2

P +1-000-000-0000
F +1-000-000-0000
tetratech.com

TETRA TECH

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

PART 1: PLANNING PROCESS AND PROJECT BACKGROUND

EXECUTIVE SUMMARY

The Town of Shandaken, New York, continues its commitment to strong floodplain management practices and enforcement as demonstrated within its Federal Emergency Management Agency (FEMA) Community Rating System (CRS) program and its community services. In October 2021, the Town enrolled in the FEMA Community Rating System program and continues to maintain a CRS Class 8 classification. This Class 8 classification represents a floodplain management program that exceeds minimum National Flood Insurance Program (NFIP) standards. A 10 percent NFIP flood insurance policy discount is available to all within the community for property owners and renters based on the Town's floodplain management program.

Town Adopted and Referenced Plans

- ✓ 2013 Town of Shandaken Floodplain Management Plan
- ✓ 2018 Town of Shandaken Floodplain Management Plan with Repetitive Loss Area Analysis
- ✓ 2024 Ulster County Hazard Mitigation Plan

Continuing from the Town's existing Floodplain Management Plan efforts, Tetra Tech has completed the 5-year update utilizing the 2018 Floodplain Management Plan assessment as the baseline for the updated analysis. The CRS Repetitive Loss Area Analysis (RLAA) is a detailed mitigation plan for a repetitive loss (RL) area. It provides more specific guidance on how to reduce damage from repetitive flooding than a community-wide Floodplain Management Plan or Hazard Mitigation Plan. It is often partnered with local, state, and federal funding resources for mitigation actions. The purpose of this RLAA is to help participating communities and homeowners understand and reduce flood risk in repetitive loss areas in the Town of Shandaken and to identify potential solutions.

FEMA defines an repetitive loss property as a property that had at least two paid flood claims of more than $1,000 each in any 10-year period since 1978 (FEMA n.d.). FEMA's CRS program defines three categories for repetitive loss communities based on the number of unmitigated repetitive loss properties. One of the CRS program's prerequisites is represented in the community's repetitive loss category. The Town of Shandaken (Town) is a Category B CRS community.

- A Category A CRS community has no repetitive loss properties or has only repetitive loss properties that have been mitigated.
- ***A Category B CRS Community is a community with at least one and less than 50 unmitigated repetitive loss properties***.
- A Category C CRS Community is a community with 50 or more unmitigated repetitive loss properties.

Category B and C CRS communities must meet the following requirements (FEMA 2025):

- Category B and C CRS communities must:
  - Prepare a map of the repetitive loss areas.
  - Review and describe the repetitive loss problem.
  - Prepare a list of addresses of all properties with insurable buildings in repetitive loss areas.
  - Undertake an annual outreach project to those addresses and submit a copy of the outreach project with each year's recertification.
- Category C CRS communities must:
  - Prepare and adopt an RLAA for all repetitive loss areas or prepare and adopt a Floodplain Management Plan.

The RLAA follows an identified five-step process. Tetra Tech developed the 2018 RLAA following the 2017 CRS Coordinator's Manual. The 5-year RLAA followed the 2025 CRS Coordinator's Manual. The five-step process from the 2017 Coordinator's Manual to the 2025 CRS Coordinator's Manual did not change programmatically. Below is an overview of how the five steps were addressed for the 5-year update.

Step 1: Advise all the property owners in the repetitive loss areas that the analysis will be conducted and request their input on the hazard and recommended actions.

- The owners and residents of repetitive loss properties in the Town of Shandaken were notified using a physical hard copy mailer, included in Appendix B and in Section 3.5.
- The Town hosted a public open house on September 15, 2025, as a citizen engagement opportunity.
- The draft plan was posted on the Town's Flood Information web page and available for public review and comment.
- The RLAA citizen engagement survey was posted on the Town's Flood Information web page for citizen engagement.

Step 2: Contact agencies and organizations that may have plans or studies that could affect the cause or impacts of flooding. The agencies or organizations must be identified in the analysis report.

The following agencies and organizations were contacted as part of this analysis (as outlined in Section 3.3). These agencies were identified by Tetra Tech and in partnership with the Town:

- Ashokan Watershed Stream Management Program
- NYS Department of Environmental Conservation
- Ulster County Department of the Environment
- Ulster County Soil and Water Conservation District
- Cornell Cooperative Extension of Ulster County
- Ulster County Emergency Services Department
- NYC Department of Environmental Protection
- Catskill Watershed Corporation
- RCAP Solutions

Step 3: Visit each building in the repetitive loss area and collect basic data.

- Building data was collected via the U.S. Army Corps of Engineers (USACE) National Structure Inventory, and ESRI ArcGIS Pro was used to select structures in the repetitive loss area. A buffer of half a mile around the repetitive loss areas for the participating jurisdiction was used to determine the repetitive loss area buildings. The 2018 repetitive loss area buildings in the Town of Shandaken were selected using the reverse damage function approach, as outlined in Section 1.2.2 Repetitive Loss Area Methodology.
- 2025 USACE National Structure Inventory and ESRI ArcGIS Pro were utilized to complete the 5-year building and area assessment.
- 2024 NFIP historical claims data was utilized for the repetitive loss area assessment. The 2018 to 2024 historical claims data identified one new repetitive loss structure. For CRS reporting purposes, the one new repetitive loss structure is within an existing repetitive loss area. No changes to the 2018 established repetitive loss areas.
- Each of the 2018 repetitive loss areas received a detailed 2025 mapping review with the Town of Shandaken. 2018 repetitive loss areas and sources of flooding were reconfirmed for the 5-year update.

Step 4: Review alternative approaches and determine whether any property protection measures or drainage improvements are feasible.

- The Town's NFIP aggregate insurance information was provided from FEMA's Community Information System for CRS Activity 370, Flood Insurance Assessment.
- Updated review of alternative approaches as identified in CRS Activity 360, Property Protection Assistance and CRS Activity 540, Drainage System Maintenance completed.
- Updated review of homeowner, local, state, and federal property protection measures and mitigation actions.
- Updated review of ongoing local-level projects, such as flood control projects and stormwater projects that may mitigate flood risk.

Step 5: Document the findings. A separate analysis must be conducted for each area. In general, separate reports are preferred for each area, but in cases in which several areas have similar building and flooding characteristics and similar mitigation measures are appropriate, the analysis can be assembled into a single report.

- Nine updates for 2025 were submitted to NFIP Underwriting/FEMA-NFIP Customer Service Center with qualified mitigations and/or addresses that could not be located. These were received and acknowledged with FEMA-NFIP Customer Service Center via email. For CRS reporting purposes, these nine structures were subtracted from the Town's repetitive loss inventory. The Town remains a CRS Category B community.
- The 2025 updated analysis has identified an update to the original 2018 repetitive loss area boundaries.
  - The 2018 repetitive loss boundaries remain and are identified as sub-repetitive loss areas. There are 171 primary structures within the sub-repetitive loss areas. The sub-repetitive loss areas will receive an annual hard copy mailer specific to the area.
  - The Town has redefined its priority communication area as all structures within the Special Flood Hazard Area (SFHA). 171 structures within the 11 sub-repetitive loss area will continue to receive the required 502 repetitive loss annual letter. The Town will enhance its annual outreach projects to include a hard copy mailer to the remaining 380 structures within the SFHA to communicate important flood-related information with their citizens.
  - The waterways are identified as the continued source of flooding and flood risk communication is a priority outreach project identified by the Town and align with the flood sources identified in the 2018 Floodplain Management Plan and the 2018 RLAA.

1. INTRODUCTION

1.1 OVERVIEW

1.1.1 Repetitive Loss Properties and the Community Rating System

A repetitive loss property is defined by FEMA as a property for which two or more NFIP losses of at least $1,000 each have been paid within any 10-year rolling period since 1978 (FEMA, 2013). From 1978 through 2011, about a quarter of all claims paid under the NFIP nationwide were for repetitive loss properties, even though such properties make up fewer than 2 percent of all NFIP insurance policies (NFIP/CRS, 2011).

Federal programs such as the CRS program encourage communities to identify and mitigate the causes of repetitive losses. The first step is to map repetitive loss areas, which are contiguous areas that include one or more properties on FEMA's list of repetitive loss properties and all nearby properties with exposure to the same or similar flooding conditions. FEMA considers listed repetitive loss properties to be indicative of an overall repetitive loss problem that may affect other nearby properties. Designation of repetitive loss areas around listed repetitive loss properties allows an evaluation of actual or potential flooding problems at properties that may not have flood insurance or may have had only a single previous claim. This ensures that all properties with the same exposure to flood risk are addressed equally.

CRS Category B and C CRS communities must meet the following requirements (FEMA 2025):

- Prepare a map of repetitive loss areas.
- Review and describe each area's repetitive loss problem.
- Prepare a list of the addresses of all properties in the repetitive loss areas with insurable buildings, which are defined to include the following:
  - A structure that is affixed to a permanent site and has two or more outside rigid walls and a fully secured roof.
  - A manufactured home (also known as a mobile home) built on a permanent chassis, transported to its site in one or more sections, and affixed to a permanent foundation.
  - A travel trailer without wheels, built on a chassis and affixed to a permanent foundation, that is regulated under the community's floodplain management and building ordinances or laws.
- Undertake an annual outreach project to those addresses.

1.1.2 Town of Shandaken RLAA

The Town of Shandaken has 30 FEMA-designated repetitive loss properties as identified by the 2024 FEMA data. These properties were mapped in 2018 within 11 repetitive loss areas, and a detailed analysis was conducted for each area under the 2018 Town of Shandaken Floodplain Management Plan. For 2025 purposes, the 2018 assessment was utilized as a baseline for the 2025 update. FEMA prescribes the following five-step process for conducting an area analysis:

- Step 1—Advise all the property owners in the repetitive flood loss area that the analysis will be conducted.
- Step 2—Contact agencies or organizations that may have plans that could affect the cause or impact of the flooding.
- Step 3—Collect data on the analysis area and each building in it to determine the causes of the repetitive damage.
- Step 4—Review alternative mitigation approaches and determine whether any property protection measures or drainage improvements are feasible.
- Step 5—Document the findings in a report.

This report documents the fulfillment of the CRS requirements for an RLAA, following the five-step area analysis process. As required under Step 5, it provides the following information:

- A summary of the process followed (Part 1: Sections A.6.2 – A.6.5)
- Problem statements with maps for each area (Part 2: Chapters 1–12)

- A table of basic information about each building in the area (Part 2: Chapters 1–12)
- A description of alternative approaches considered to address the problem (Part 1: Sections A.10.1 – A.10.14)
- A set of recommended action items to address the problem (Part 2: Chapters 1–12)

Individual properties and structures are counted and described in this document, but specific address information is withheld under the federal Privacy Act of 1974. A separate document on file with the Town of Shandaken for internal use only correlates the property ID numbers presented here with specific address information.

1.1.3 Numbering and Nomenclature

In designating federally recognized repetitive loss properties, FEMA assigns a seven-digit repetitive loss number (RL#) to each property using a nationally defined numbering system. For the Town of Shandaken RLAA, the repetitive loss properties were grouped and mapped 1 through 12. These numbers are referenced as repetitive loss Map numbers in this report. Table 1-1 represents the area naming convention for reporting and mapping. For historical records, the defined sub-repetitive loss area boundaries remain the same from 2018 to the 2025 assessment. The 2025 analysis identifies repetitive loss structures that have been demolished and/or addresses that cannot be verified. The updated 2025 CRS repetitive loss inventory for the Town is 18 repetitive loss areas.

Based on geographic distribution, repetitive loss areas were defined as one or more repetitive loss properties. Areas were designated with a place name indicating the general location of the area. Table 1-1 summarizes the numbering and naming used in this analysis.

Table 1-1. Naming and Number of the Town of Shandaken Repetitive Loss Properties Areas

Repetitive Loss Area Name	Town of Shandaken RL Map Number
Big Indian-1	1
Big Indian-2	2
Big Indian-3	3
Mt Tremper-1	4
Mt Tremper-2	5
Mt Tremper-3	6
Phoenicia-1	7
Phoenicia-2	8
Phoenicia-3	9
Shandaken-1	10
Shandaken-2	11

1.2 ANALYSIS METHODOLOGY

1.2.1 Basic Requirements

There are two key sets of requirements to be met for an RLAA:

- **Repetitive loss area mapping** requirements are contained in Section 503 of the CRS Coordinator's Manual and in the supplemental publication, *Mapping Repetitive Loss Areas*. (The supplemental

publication was being updated at the time this RLAA was being developed and therefore was not available to provide directions to this process.)

- **Building data collection** requirements contained in Section 512.b of the CRS Coordinator's Manual:
  - Visit each building in the repetitive loss area and collect basic data.
  - Collect data during the site visit that is sufficient to make a preliminary determination of the cause of the repetitive flooding and of mitigation measures that would be appropriate to address the problem. This usually includes a review of drainage patterns around the building, the condition of the structure, and the condition and type of foundation.
  - The person conducting the visit should not have to enter the property; adequate information should be collected from observations from the street.
  - Floor elevations or historical flood levels are not required but can be helpful if available.
  - The date of each building's insurance claim can help identify the cause of the flooding (e.g., rainfall or overbank flooding). The amount of the claim can help determine the amount of damage. Every year, each repetitive loss community is provided with a list of its historical insurance claims. This includes single-claim properties. Non-repetitive loss communities that elect to do an RLAA may request this data from the CRS program.
  - This step may be done using the "limited data view" of the National Flood Mitigation Data Collection Tool.

More information on building data can be found in *Selecting Appropriate Mitigation Measures for Floodprone Structures* (FEMA-551).

1.2.2 2018 Repetitive Loss Area Methodology

2018 RLAA. For the Shandaken RLAA, building data collection requirements were met using an alternative to the approach outlined in the CRS Coordinator's Manual. The 2018 RLAA planning team selected the alternative approach—a "reverse damage function" methodology—for initial identification of repetitive loss areas for the following reasons:

- The Town of Shandaken provided repetitive loss data, obtained from FEMA on September 12, 2018. Because this data did not include the current status of certain mitigated properties, the information was updated by the Ulster County Department of the Environment to reflect the most accurate information regarding the status of repetitive loss properties. Discrepancies between the FEMA data and the status of mitigated properties have been documented by the Ulster County Department of the Environment and are targeted for updated AW-501 submittals to FEMA.
- A Level 2, user-defined flood model using Hazus-MH, version 4.2 was constructed in 2018 to support the development of the *2018 Town of Shandaken Floodplain Management Plan*. The model was possible due to the quality of the Town of Shandaken Real Property Tax Assessor data available to the planning team. The assessor data provided key building attributes to model flood risk, such as date of construction, foundation type, occupancy class, square footage, and structure condition. The detailed model data allowed the use of the selected alternative approach.

Description of Selected Approach

The selected reverse damage function approach used available data and capabilities to prepare the RLAA. The alternative approach achieves the same objectives as the approach prescribed in the 2017 CRS Coordinator's

Manual (Section 512b), while providing the County with a better protocol for maintaining data in the future to identify properties in a defined repetitive loss area and determine the cause of repetitive flooding.

The reverse damage function approach is a quantitative process based on modeling principles rather than the qualitative process outlined in the 2025 CRS Coordinator's Manual. It uses an existing model to apply the principles of the "depth-damage function," which is the cornerstone of risk assessment in FEMA's Hazus-MH and Benefit-Cost Analysis programs. Both of these programs estimate damage using curves that show the percentage of asset value that will be damaged as a function of the depth of floodwaters. These depth-damage curves are well-established as a basis for estimating losses caused by flooding.

The reverse damage function methodology uses known values of damage from a flood event, based on filed claims, to estimate what the floodwater depth was for that event. The following protocol was as follows:

- Each repetitive loss property from the FEMA Region II Repetitive Loss Property database (as of 11/30/2017) was mapped in GIS to look for possible groupings based on proximity. The GIS mapping was based on the LiDAR-generated digital elevation model used to prepare the *2018 Town of Shandaken Flood Mitigation Plan*. This digital elevation model has a 2-foot resolution.
- The maximum loss for each repetitive loss property was determined by reviewing all repetitive loss entries and was used in the reverse damage function methodology. Replacement cost for each structure was taken from the replacement cost value in the repetitive loss property database to calculate a flood depth based on the damage and replacement cost at the time of the flood event.
- The percent damage "X" was calculated as:
  - X = Z ÷ Y
  - where:
  - X is the percent damage (to be determined).
  - Y is the replacement cost of the structure (based on assessor information).
  - Z is the estimated loss (based on the flood insurance claim).
- Once the percent damage was determined, the corresponding flood depth was determined by looking at the U.S. Army Corps of Engineers 2003 *Generic Depth-Damage Relationships for Residential Structures*. These are the same damage functions contained in FEMA's Hazus-MH and Benefit-Cost Analysis Re-engineering (BCAR) platforms. They represent projected flood depths above the top of the finished floor.
- The determined flood depth was applied to the repetitive loss structure. Using the foundation type from assessor's data, the depth was added to the top of the finished floor. For a structure with a slab foundation, the top of the finished floor was set at 1 foot above adjacent grade. For a structure with a crawlspace foundation, the finished floor was set at 2 feet above adjacent grade. For a structure with a basement, the finished floor was set 3 feet above adjacent grade. These parameters are based on standard building practices.
- Once the depth was applied to the finished floor, it was extended across the digital elevation model until it ran to zero depth (high ground), and a boundary was delineated. These boundaries were projected north, south, east, and west for each property. In areas with multiple repetitive loss properties, the depth for each property was used for this exercise to generate a comprehensive grid.
- The historical claims database provided to the County by FEMA Region II database (as of 11/30/2017) for repetitive loss requirements of the CRS program was used to identify properties that had filed single flood insurance claims in each delineated area. Historic claim distributions were reviewed and used to refine the repetitive loss areas if necessary.

- The boundary for each repetitive loss area was intersected with the general building stock generated as part of the 2018 Town of Shandaken Floodplain Management Plan. Each structure within the delineated boundary was determined to be a property potentially subjected to repetitive flooding and was added to a repetitive loss list for the Town of Shandaken.
- Property condition assessments were made using Shandaken Real Property Tax Assessor data and the Google Street View application, where applicable.

Using this methodology, 162 repetitive loss areas were delineated. Maps and descriptions of the causes of flooding for each area can be found in Chapters 1–12.

The final step was to determine the cause of the flooding, considering the following findings from the initial identification. The planning team concluded that the majority of the repetitive losses are associated with riverine flooding as most of the properties are within a FEMA-designated flood zone.

Secondary Identification

Once the initial identification of the repetitive loss areas was completed using the reverse-damage-function methodology, the planning team performed a secondary review of each repetitive loss area based on three questions about each area:

- Is there really a repetitive loss problem in this area, based on local knowledge?
- Does the list of properties make sense based on what we know about the area?
- Does the Town have any additional qualifying data on the area to justify adding or removing properties?

Adjustments were made after applying these questions to each repetitive loss area. The initial identification for the RLAA indicated 162 properties in repetitive loss areas, with 162 insurable structures. Based on the secondary identification, the list was adjusted to 171 properties with 171 insurable structures. This became the final repetitive loss area mailing list for the Town of Shandaken.

1.2.3 Property Condition Assessment

A subjective assessment for each property in the repetitive loss areas was assigned by the planning team using assessor's data and visual confirmation based on Google Street View, where possible. Five categories of property conditions as represented in the Shandaken Real Property tax data:

- **Excellent**
- **Good**
- **Normal** (Used as default if condition could not be determined)
- **Fair**
- **Poor**

1.2.4 Foundation Type

In the Town of Shandaken, there are generally three types of foundations:

- A basement foundation consisting of structural foundation walls that bear on foundation footings along the perimeter of the basement.

- A crawlspace, or raised foundation, is built above the ground, with just enough room to crawl underneath. There are stem walls on the perimeters, pierced in-between, with a girder system and floor joists on top of that. The foundation is high enough to leave at least 2 feet below to crawl into for access to the home's mechanical systems.
- Slab foundation is usually concrete poured directly onto the ground. This type of foundation uses concrete rather than wood to help support the weight of the home.

1.2.5 2025 Repetitive Loss Area Methodology

2025 RLAA Update. For the 5-year update, Tetra Tech, in partnership with the Town of Shandaken, utilized 2018 data for the baseline 2025 review and update. The following data was utilized for a detailed data and mapping review of the Town's 2018 repetitive loss boundaries and the entire SFHA.

- 2025 USACE National Structure Inventory and ESRI ArcGIS Pro were utilized to complete the 5-year building and area assessment.
- 2025 USACE National Structure Inventory was utilized to complete the building stock inventory, property condition assessment, number of stories, square footage, use, occupancy, and foundation type.
- 2024 NFIP historical claims data was utilized for the repetitive loss area assessment. The 2018 to 2024 historical claims data identified one new repetitive loss structure. For CRS reporting purposes, the one new repetitive loss structure is within an existing repetitive loss area. No changes to the 2018 established repetitive loss areas.

Each of the 2018 repetitive loss areas received a detailed 2025 mapping review with the Town of Shandaken. 2018 repetitive loss areas and sources of flooding were reconfirmed for the 5-year update. From the 2025 assessment, the Town has identified the entire SFHA as a priority audience for enhanced communication with the existing 2018 11 sub-repetitive loss areas remaining unchanged. The continued source of flooding is associated with riverine flooding. Each sub-repetitive loss area is discussed in detail PART 2: ANALYSIS OF INDIVIDUAL REPETITIVE LOSS AREAS.

1.3 TOWN OF SHANDAKEN COMMUNITY PROFILE

The Town of Shandaken profile information is presented in the plan and analyzed to develop an understanding of the repetitive loss area. This profile provides general information for the Town of Shandaken (physical setting, population and demographics, general building stock, and land use and population trends) and critical facilities located within the town.

1.3.1 General Information

The Town of Shandaken is in the Catskill Mountains, in the northwest corner of Ulster County. The Town's name is of Native American origin and means "land of rapid waters". The Town is located along the Route 28 corridor within the Catskill Park and State Forest Preserve. The Town lands are over two-thirds state-owned and include Slide Mountain, which is the highest peak in the Catskill range at 4,180 feet. The Town was originally settled around the Revolutionary War period and was formally established on April 9, 1804 (Town of Shandaken n.d.).

1.3.2 Location

The Town of Shandaken is one of the 24 municipalities that make up Ulster County. Ulster County is located in southeast New York State, in the Mid-Hudson Region of the Hudson Valley. It has a total area of 1,161 square miles. Ulster County is bordered to the north by Greene County, to the northeast by Columbia County, to the east by Dutchess County, to the south by Shandaken, and to the west by Sullivan and Delaware Counties (Ulster County Department of Emergency Communications/Emergency Management 2009).

The Town of Shandaken is located within the central Catskill Mountain Region of New York State (Town of Shandaken Comprehensive Plan, 2005). The Town is found in the northwestern portion of Ulster County and is bordered to the east by the Town of Woodstock, to the south by the Towns of Denning and Olive, to the west by the Town of Hardenburgh, to the west and north by the Town of Middletown, and to the north by the Towns of Hunter and Lexington (FEMA, 1989). The Town is made up of 12 hamlets: Woodland Valley, Oliverea, Chichester, Bushnellsville, Mt. Pleasant, Mt. Tremper, Phoenicia, Shandaken, Allaben, Big Indian, Pine Hill, and Highmount (Town of Shandaken Comprehensive Plan, 2005).

1.3.3 Watershed and Drainage

A watershed is the land area that drains water into a particular waterbody, such as a stream or wetland.

The Town of Shandaken is located within the Upper Esopus and Delaware River Watersheds (Town of Shandaken, 2012; Ulster County, Date Unknown). The Town of Shandaken is located within the 425-square-mile Esopus Creek Watershed in the Catskill Mountains. The watershed is divided into two parts by the Ashokan Reservoir: the area above the dam is referred to as the Upper Esopus Watershed, and the area below the dam is the Lower Esopus Watershed

The Upper Esopus Creek runs mostly through the Town of Shandaken and crosses the Town of Olive for approximately one mile before reaching the Ashokan Reservoir. The Upper Esopus Creek Watershed covers approximately 192 square miles in the south-central Catskill Mountain Region of southeast New York State.

The Esopus Creek Watershed is an important source of water for the City of New York. According to the Upper Esopus Creek Management Plan, the Catskill District System's water supply is characterized by several key features. The Upper Esopus Creek is a regulated river by inter-basin transfer of water. The Shandaken Tunnel and its outfall, often referred to as the "Portal," is a handmade 18-mile aqueduct that connects the Schoharie Reservoir to the Upper Esopus. The Catskill District of New York City's West-of-Hudson water supply system is one of three systems that supply water to New York City, and it includes the Schoharie Reservoir, Shandaken Tunnel, Ashokan Reservoir, and the Catskill Aqueduct west of the Hudson River. Approximately 40 percent of the City's average water supply demand is provided by the Catskill System.

New York City must abide by two regulatory documents administered by the New York State Department of Environmental Conservation (NYSDEC) when operating the Shandaken Tunnel: Title 6 NYCRR Part 670 "Reservoir Release Regulations: Schoharie Reservoir - Shandaken Tunnel - Esopus Creek" and a State Pollution Discharge Elimination System (SPDES) permit. Together, these two regulations provide for flow, temperature, and turbidity thresholds to protect aquatic biota. Also, Part 670 allows up to four recreational releases for whitewater recreation to be granted per year by the NYSDEC (Cornell Cooperative Extension - Ulster County, 2007).

It is important to note that a separate "Catskill Turbidity Control Study" has been conducted in parallel with this effort. The recently concluded Phase II of that study has outlined structural and operational modification options

for controlling turbidity releases from the Shandaken Tunnel that are currently being considered by federal, state, and local authorities (Cornell Cooperative Extension, January 2007).

Approximately 95 percent of the total Upper Esopus Watershed consists of forested land. Historical practices of logging and bark peeling activities have altered the stream flow. The watershed receives approximately 50 to 60 inches of precipitation each year (From Section 905(b) Reconnaissance Study - Esopus and Plattekill Creeks Watershed, Ulster and Greene Counties, New York (August 2008).

According to the Stony Clove Creek Stream Management Plan, the Stony Clove Creek watershed is also partially located in the Town of Shandaken. It is located in the central Catskill Mountain region of southeast New York State and drains an area of 32.3 square miles. The Stony Clove Creek flows from its headwaters at Notch Lake to its confluence with the Esopus Creek in the hamlet of Phoenicia. Approximately 80 percent of the watershed is in Greene County, and the remainder of it is in Ulster County. The Stony Clove Creek watershed is bound by some of the highest peaks in the Catskills, ranging in altitude from 2,220 to 4,040 feet (Greene County Soil and Water Conservation District, 2005).

1.3.4 Flooding Issue

Floods are the most frequent and costly natural hazards in New York State in terms of human hardship and economic loss, particularly to communities that lie within floodprone areas or floodplains of a major water source. As defined in the NYS HMP (NYS DHSES 2014), flooding is a general and temporary condition of partial or complete inundation on normally dry land from the following:

- Riverine overbank flooding
- Flash floods
- Mudflows or debris floods
- Dam- and levee (berm)-break floods
- Local draining or high groundwater levels
- Ice jams

Many floods fall into three categories: riverine, coastal, and shallow (FEMA 2007). Other types of floods may include ice jam floods, alluvial fan floods, dam failure floods, and floods associated with local drainage or high groundwater (as indicated in the previous flood definition). For the purpose of this Floodplain Management Plan and as deemed appropriate by the Town of Shandaken, riverine, shallow, flash, ice jam, and dam failure flooding are the main flood types of concern and are further discussed below.

Riverine and Flash Flooding

Riverine floods are the most common flood type. They occur along a channel and include overbank and flash flooding. Channels are defined, ground features that carry water through and out of a watershed. They may be called rivers, creeks, streams, or ditches. When a channel receives too much water, the excess water flows over its banks and inundates low-lying areas (FEMA - NRI n.d.).

Flash floods are defined by the National Weather Service as "A flood caused by heavy or excessive rainfall in a short period of time, generally less than 6 hours. Flash floods are usually characterized by raging torrents after heavy rains that rip through riverbeds, urban streets, or mountain canyons sweeping everything before them. They can occur within minutes or a few hours of excessive rainfall. They can also occur even if no rain has fallen, for instance, after a levee or dam has failed, or after a sudden release of water by a debris or ice jam." (National Weather Service [NWS] 2018).

Shallow Flooding

Stormwater flooding can result from poor local drainage and elevated groundwater levels. Heavy rainfall may cause flooding outside of mapped floodplains or visible waterways, especially when the ground cannot absorb water quickly enough or when runoff exceeds drainage capacity. In winter and spring, frozen soil and snow buildup can further hinder drainage, leading to localized ponding. These issues are more common in flat areas and tend to worsen with urban development, which increases impervious surfaces and accelerates water accumulation. Without upgraded drainage systems, shallow street flooding may occur due to insufficient channel capacity (FEMA, 1997).

Flooding can occur even without visible surface water, particularly when groundwater levels are high. This is a common issue in areas with seasonally elevated groundwater or following extended periods of heavy rainfall. Basements are especially vulnerable to groundwater intrusion (FEMA, 1997).

Urban drainage flooding is driven by increased runoff from developed areas. Drainage systems are designed to quickly remove surface water from streets and urban zones, channeling it through closed systems to nearby streams. While effective at preventing localized flooding, these systems bypass natural processes like infiltration and evaporation. As a result, water reaches streams more rapidly and in greater volumes, increasing the risk and severity of downstream flooding (FEMA, 2007).

Combined Sewer Overflows (CSOs) occur when stormwater, snowmelt, and wastewater are collected in a single pipe system and exceed the system's capacity during wet weather. These systems are designed to overflow under such conditions, discharging untreated water into nearby waterbodies. CSOs combine stormwater runoff, domestic sewage, and industrial wastewater, and are a significant concern during periods of heavy precipitation.

Ice Jam Flooding

Ice jams occur when floating ice is carried downstream and begins to pile up behind an obstruction in the river or stream. These obstructions can include bends in the river, tributary mouths, areas where the slope of the channel decreases, as well as man-made structures like dams and bridges. When ice accumulates in these areas, it can block the flow of water, causing flooding upstream. If the jam breaks suddenly, it can lead to flash flooding downstream (NOAA, 2013).

The likelihood of ice jams depends on both weather conditions and the physical characteristics of the waterway. They are most common in places where the channel slope naturally flattens, in culverts, or in shallow sections where ice can freeze solid. Ice jams can form during various times of the year. In the fall, frazil ice can begin to accumulate during freeze-up. In mid-winter, solid ice formations known as anchor ice can develop when stream channels freeze completely. In the spring, rising water levels from snowmelt or rainfall can break up existing ice cover, which then collects at obstructions such as bridges (NYS DHSES, 2014).

Dam Failure Flooding

A dam or a levee is an artificial barrier that has the ability to impound water, wastewater, or any liquid-borne material for the purpose of storage or control of water (FEMA 2004). Dams are man-made structures built across a stream or river that impound water and reduce the flow downstream (FEMA 2003). They are built for the purpose of power production, agriculture, water supply, recreation, and flood protection. Dam failure is any malfunction or abnormality outside of the design that adversely affects a dam's primary function of impounding water (FEMA 2018). Levees typically are earthen embankments constructed from a variety of materials ranging from cohesive to cohesionless soils (USBR 2012). Dams and levees can fail for one or a combination of the following reasons:

- Overtopping caused by floods that exceed the capacity of the dam (inadequate spillway capacity due to uncontrolled release or exceedance of design)
- Prolonged periods of rainfall and flooding
- Deliberate acts of sabotage (terrorism)
- Structural failure of materials used in dam construction
- Movement and/or failure of the foundation supporting the dam
- Settlement and cracking concrete or embankment dams
- Piping and internal erosion of soil in embankment dams.
- Inadequate or negligent operation, maintenance, and upkeep
- Failure of upstream dams on the same waterway
- Earthquake (liquefaction / landslides) (FEMA 2019)

1.3.5 Historical Events

Many sources provided flooding information regarding previous occurrences and losses associated with flooding events throughout the Town of Shandaken. With multiple sources reviewed for the purpose of this Flood Management Plan, loss and impact information for many events could vary depending on the source and the accuracy of monetary figures is based on information available at the time of development of this plan.

Between 1954 and March 2019, FEMA included the State of New York in 52 flood-related disasters (DR) or emergencies (EM) classified as one or a combination of the following disaster types: severe storms, flooding, hurricane, tropical storm, tropical depression, coastal flooding, inland flooding, tornadoes, and straight-line winds. Generally, these disasters cover a wide region of the state; therefore, they may have impacted many counties. Ulster County was included in 17 of these flood-related declarations.

Known flood events, including FEMA disaster declarations, which have impacted the Town of Shandaken between December 1950 and August 2024 are identified in Table 1-2. As seen in the table below, a majority of the flood-related events have been riverine and flash flooding. The Town has not experienced any flood events related to dam failures. It is noted that not all events that have occurred in the Town of Shandaken are included due to the extent of documentation and the fact that not all sources may have been identified or researched. Loss and impact information could vary depending on the source. Therefore, the accuracy of monetary figures discussed is based only on the available information identified during research for this RLAA.

Table 1-2 Flooding Events in the Town of Shandaken, 1950–2024

Dates of Events	Event Type	FEMA Declaration Number (if applicable)	Ulster County Designated?	Event Details	Source
December 8, 1950	Flooding	N/A	N/A	During a storm event, the Esopus Creek did a devastating job and by the time it reached Oliverea, it took out bridges and rushed over the road 4 feet deep. Where the Hatchery Stream crosses Oliverea Road, the little bridge remained but the roadway was washed out on either side. Where the Esopus Creek reaches the turn near Platt's barn, it tore out a corner and carried away a car. It cut gouges out of the bank within one or two feet of some tourist cottages just above Dunham Bridge. The stream, as it joined the Birch Creek, flooded the Fennelly meadow with eight to ten feet of water. A home was lifted from its foundation and took out the Weybridge and road. Birch Creek took out the bridge at Greenbergs and undermined a barn.	Catskill Mountain News, Town Input
April 6, 1951	Flooding	N/A	N/A	Heavy rains and melting snow caused the Esopus Creek to rise above its November high-water mark. It caused widespread damage in Ulster County. Most of the damage was in Phoenicia and the areas below. The Chichester and Woodland Valley streams are combined in this area. The streets of Phoenicia were flooded, and some people had to leave their homes. Many businesses were flooded as well. A bridge was carried away near Stony Clove Notch. In Lanesville, residents called this event one of the worst floods. The Stony Clove Valley Stream dug out a chunk of pavement on Notch Road, 100 feet long and 50 feet deep.	Catskill Mountain News, Town Input

Dates of Events	Event Type	FEMA Declaration Number (if applicable)	Ulster County Designated?	Event Details	Source
October 18-20, 1955	Flooding	N/A	N/A	Heavy rains flooded the Oliverea Valley, completely destroying the post office and a small cottage in Oliverea. Land and roads were washed away. Telephone and electricity was cut off. Guests at the Valley View House and at the Slide Mountain House were caught in the Valley and were unable to return home. A bridge was washed out behind a home in the Big Indian Mountain club. The Manor House bridge was almost impassable due to debris and gravel. In Pine Hill, a bank behind a home gave way and slid down, breaking through kitchen doors and spreading through the entire first floor. Several other people experienced damage to their homes. Many basements were flooded, oil burners were put out and several lawns washed out. One water main was broken which caused a few homes to be without water. Several residents in Woodland Valley had to evacuate due to the rising waters of Esopus and its tributaries. Many roadways were blocked, and traffic had to be rerouted. Road damage due to undermining was severe along sections of Route 28. Other damage included the washing away of part of the Shandaken Manor Hotel.	Catskill Mountain News, Town Input
September 13, 2971	Severe Storms and Flooding	DR-311	Yes	N/A	FEMA
June 23, 1972	Tropical Storm Agnes	DR-338	Yes	Tropical Storm Agnes caused some damage in the Catskill area. Several bridges and roads suffered minor damage, and there were reports of damage to private properties in the Town of Shandaken. Esopus Creek and its tributaries crested during the morning. Four campers had to be rescued from Woodland Valley when their exit was cut off, and one of them suffered leg burns from a gas lantern explosion. Ulster County Highway crews cleared fallen trees from county roads input in the Woodland Valley and Phoenicia area. In Oliverea Valley, the main damage was seen on the property of Suzie's Cabins, where several feet of lawn and fill next to the stream were washed away. Further inspection of bridges and streams in the Town was made by federal and state officials.	FEMA, Town Input

Dates of Events	Event Type	FEMA Declaration Number (if applicable)	Ulster County Designated?	Event Details	Source
July 20, 1973	Severe Storms, Flooding	DR-401	Yes	N/A	FEMA
December 27, 1973	Severe Storms, Flooding	N/A	N/A	Torrential rain fell in the Town of Shandaken, causing large amounts of damage due to water running off the mountain side. Residents in the Woodland Valley County bridge reported to the supervisor's office Friday morning that water was up to the floor of the bridge and the span seemed to be swaying in the current of Esopus. Two 8-foot by 50-foot culvert pipes, each weighing several tons, were washed away from the property of Ray Smith, where contractors are replacing a highway bridge on Route 212, Willow Road. One of the pipes wedged under the old Route 28 bridge was Mount Tremper Four Corners was partially sticking out, diverting the water to Brookside Road, which became flooded. Plank Road, the former Route 28, was washed out and closed to traffic. The worst flooding conditions were at the O'Donnell Five-Star camp near Mount Tremper. The former Hoffinan diner and a property in the vicinity of the Hoffinan bridge were flooded. Three trailers were damaged by water, and two cars were towed out. A new housing development off Plank Road was hit hard. A new road was being completed, with bridges and culvert installations, and these were destroyed. The Sleepy Hollow campsite below Phoenicia had two or three feet of water by the parked trailers, and three trailers were flooded at their foundations. The site of the proposed Odell shopping area on new Route 28 had slight flooding. The Mount Tremper fire trail constructed by the Department of Environmental Conservation was completely washed out.	Town Input
February 2, 1981	Ice Jam	N/A	N/A	An ice jam occurred along the Esopus Creek in the Town of Shandaken. A gage recorded a height of 7.82 feet and a discharge of 120 cfs.	CRREL
February 11, 1981	Ice Jam	N/A	N/A	An ice jam occurred along the Esopus Creek in the Town of Shandaken. A gage recorded a height of 7.78 feet and a discharge of 450 cfs.	CRREL
March 28-April 8, 1984	Coastal Storms, Flooding	DR-702	Yes	In April 51h, the gage on Esopus Creek at Cold Brook recorded a height of 17.75 feet (flood stage of 11 feet).	FEMA, NWS

Dates of Events	Event Type	FEMA Declaration Number (if applicable)	Ulster County Designated?	Event Details	Source
April 3-6, 1987	Flooding	DR-792	Yes	A low-pressure system associated with a cold front produced heavy rain over the Catskills on March 30 and 31 and showers on April 1. More than three inches fell over the headwaters of the Schoharie and Esopus basins, while generally, less than two inches fell elsewhere. The maximum rain recorded during the 24-hour period that ended on April 5 exceeded six inches and was centered on the highest peaks in the Catskills, Slide Mountain (4,204 ft) and Hunter Mountain (4,025 ft). Prevailing winds from the east and southeast and orographic effects of the Catskills combined to generate the greatest rainfall totals on the eastern slopes of the mountains. Five counties in southeastern New York were declared major disaster areas after intense rainfall on April 3- 5, 1987, caused widespread flooding. Severe frontal storms often cause flooding in the narrow, steep valleys of the Catskill Mountains. This storm occurred at a time when soil was saturated, reservoir storage was near capacity, and stream discharge was high from snowmelt. Rainfall during the storm period totaled 9.09 inches at Slide Mountain and 8.20 inches at Tannersville. Schoharie, Catskill, Esopus, Rondout Creeks, and East Branch Delaware and Neversink Rivers and their tributaries underwent the most severe flooding.	FEMA, Town Input
November 11, 1995	Flooding	N/A	N/A	Between 3–4 inches of rain fell in eastern New York State, which resulted in flooding. In the hamlet of Phoenicia, the Esopus Creek flooded, and a state of emergency was declared. Several families were evacuated in the hamlet of Woodland Valley. Ulster County had approximately $100K in damage.	NOAA-NCDC, Ulster County HMP
January 19-21, 1996	Flooding	N/A	N/A	Warm temperatures caused rapid snowmelt in Ulster County. Along with the melting snow, a storm brought 1–3 inches of rain, resulting in widespread flooding in the County. Small streams flooded across the County, washing out roads. Extensive flooding occurred along the Hudson River and Esopus Creek. Many towns in Ulster County experienced flooding. In the Town of Shandaken, five town roads were destroyed, and several homes were damaged. Evacuations occurred in the hamlets of Phoenicia and Shandaken. Ulster County experienced $10M in damage.	NOAA-NCDC, Ulster County HMP

Dates of Events	Event Type	FEMA Declaration Number (if applicable)	Ulster County Designated?	Event Details	Source
January 27-28, 1996	Flooding	DR-1095	Yes	1–2 inches of rain fell across eastern New York State, with some areas in the Catskills receiving three inches of rain. This storm, on top of already saturated soils, caused many small streams to flood in Ulster County. The Wallkill River and Rondout and Esopus Creeks flooded in the County. Evacuations occurred along the Esopus Creek and Route 28. Along the Rondout Creek at Eddyville, flooding was severe and widespread. In the Town of Shandaken, numerous roads were washed out, and the Town declared a state of emergency. Overall, the County experienced $400K in damage.	NOAA-NCDC, FEMA, Ulster County HMP
June 12-14, 1998	Flooding	N/A	N/A	Heavy rain fell across the Catskills and eastern Mohawk Valley. Three-day precipitation totals ranged from 8–10 inches. Flooding of creeks and tributaries occurred in Ulster, Fulton, Montgomery, and Greene Counties. In Ulster County, the Esopus Creek above the Ashokan Reservoir flooded. At the hamlet of Mount Tremper, the creek crested at 12.5 feet (flood stage is 11 feet). Overall, Ulster County experienced approximately $45K in damage.	NOAA-NCDC, Ulster County HMP
September 16-18, 1999	Hurrican e Floyd	DR-1296	Yes	Rainfall totals for Ulster County ranged from 4.56 inches in the Town of Kingston to 6.57 inches at Slide Mountain. In the hamlet of Phoenicia, 5.91 inches of rain were reported. Throughout the County, many trees and wires were down. Roofs of homes were blown off.	FEMA,NWS
May 18, 2000	TSTM	NIA	NIA	TSTM winds knocked down trees and powerlines at several locations in Albany, Columbia, Greene, Montgomery, Saratoga, Schoharie, and Ulster Counties. The Town had approximately $87K in property damage.	NOAA-NCDC
December 17,2000	Flooding	NIA	NIA	A record-breaking rainstorm struck eastern New York State, bringing between 2–4 inches of rain. Ulster County has hit hard. Six towns declared a state of emergency. In the Town of Shandaken, a boy drowned when he attempted to cross the West Branch of the Neversink River. Overall, the County experienced $500K in damage.	NOAA-NCDC
May3-August 12, 2000	Severe Storms and Flooding	DR-1335	Yes	N/A	FEMA

Dates of Events	Event Type	FEMA Declaration Number (if applicable)	Ulster County Designated?	Event Details	Source
May 13-June 2004	Severe Storms and Flooding	DR-1534	Yes	In the Town of Shandaken, Birch Creek flooded, topping the Academy Street Bridge and closing Main Street. Birch Creek Road washed out between Academy and Upper Birch Roads. Numerous culverts were washed out, and roads were closed due to flooding. The Town had approximately $500K in damages.	NOAA-NCDC, FEMA, Ulster County HMP
August 13-September 16, 2004	Severe Storms and Flooding	DR-156	Yes	In the hamlet of Phoenicia, streams in the area flowed over County Route 40.	FEMA, NOAA-NCDC
September 17, 2004	Tropical Depression Ivan	DR-1565	Yes	Tropical Depression Ivan caused streams to overflow onto Route 40 in Phoenicia. The gage on Esopus Creek at Cold Brook recorded a height of 13.6 feet on September 18 (flood stage is 11 feet).	FEMA, Town Input, NWS
April 2-4, 2005	Severe Storms and Flooding	DR-1589	Yes	A state of emergency was declared, due to flooding, throughout Ulster County. Rainfall totals in the County ranged from 2.67 inches in Saugerties and 6.15 inches in West Shokan. In the Town of Shandaken, Bushnellsville Creek overflowed its banks and flooded Route 42. Overall, the County had approximately $275K in damage. FEMA approved over $1.6M in public assistance for Ulster County.	NOAA-NCDC, FEMA, NWS
June 26-July 10, 2006	Severe Storms and Flooding	DR-1650	Yes	The gage on Esopus Creek at Cold Brook recorded a height of 15.52 feet on June 28th (flood stage is 11 feet).	FEMA, NWS
April 15-16, 2007	Severe Storms and Inland/Coastal Flooding	DR-1692	Yes	An intense storm brought flooding, heavy rain, and wet snow to the region. Rainfall amounts of 6–8 inches were reported across the eastern Catskills, mid-Hudson Valley, and western New England. Rainfall totals for Ulster County ranged from 4.30 inches in Kingston to 7.43 inches in West Shokan. The gage on Esopus Creek at Cold Brook recorded a height of 13.36 feet on April 16 (flood stage is 11 feet).	FEMA, NWS
June 19, 2007	Severe Storms and Flooding	DR-1710	Yes	FEMA approved over $960K in disaster assistance for Ulster County.	FEMA
September 30- October 1, 2010	Severe Storms and Flooding	N/A	N/A	Rainfall totals in Ulster County ranged from 3.14 inches in Saugerties to 8.27 inches in the hamlet of Phoenicia. In the Town of Shandaken, Route 214 was closed in both directions due to flooding.	NWS

Dates of Events	Event Type	FEMA Declaration Number (if applicable)	Ulster County Designated?	Event Details	Source
December 1, 2010	Flood	N/A	N/A	Floodwaters from the Stony Clove Creek overtopped their banks and the Main Street Bridge and flooded the business district of Phoenicia.	Town of Shandaken
April 25-30, 2011	Severe Storms, Flooding, Tornadoes and Straight-line Winds	DR-1993	Yes	Rainfall totals in Ulster County ranged from 0.75 inches in Kingston to 2.24 inches in the hamlet of Phoenicia.	FEMA, NWS
August 28-29,2011	Tropical Storm Irene	DR-4020	Yes	Torrential rains from Tropical Storm Irene forced hundreds of evacuations in the Hudson Valley, causing power outages, closed 137 miles of New York Thruway, swelled creeks and rivers, and widespread property damage. Ulster County was among the three worst-hit counties in the state. A total of 86 roads were closed across the county due to downed trees, fallen power lines, and flooded roadways. About 56,000 utility customers were without power, and over 200 people evacuated their homes. The Town of Shandaken was one of the harder hit communities. The Upper Esopus and Stoney Clove Creeks overflowed their banks and flooded the hamlets of the town, including Phoenicia. Emergency responders and swift-water rescue teams had to rescue two families in the town when their homes were washed off their foundations. Businesses in the town were inundated with mud two feet deep, and three bridges in the town were severely damaged. The bridges had to be replaced. The Cold Brook Bridge was completely washed away. The Town Supervisor stated that this was the highest Esopus Creek has been in years. NWS rain gages measured more than 11.5 inches on Slide Mountain in the Town of Shandaken. The Esopus Creek at Cold Brook flood gage recorded a crest of 23.4 feet, the flood stage is 11 feet. This is the flood of record for this gage.	FEMA, NOAA-NCEI, Record Online, NBC 4, NWS

Dates of Events	Event Type	FEMA Declaration Number (if applicable)	Ulster County Designated?	Event Details	Source
September 7-11, 2011	Remnants of Tropical Storm Lee	DR-4031	Yes	On September 7, just after flood waters from Tropical Storm Irene had receded in the Town of Shandaken, remnants of Tropical Storm Lee crept into the region, producing substantial rains and river flooding across parts of central New York State. Bands of heavy rain throughout the day on September 8 brought streams back to flood stage, which threatened more flooding in areas of recovery from Tropical Storm Irene with temporary infrastructure across the town. The storm did cause minor flooding along the Esopus Creek, upstream of the Ashokan Reservoir. The Esopus Creek at Cold Brook gage recorded a crest of 14.21 feet on September 7 (flood stage is 11 feet) and 11.8 feet on September 8. The majority of impacts from the storm were primarily due to the weakened state of critical infrastructure and operations from Tropical Storm Irene. Rainfall ran off from the storm broke through some of the temporary stream channel and roadway repairs that had been completed in the aftermath of Irene. The Town lost temporary infrastructure on Oliverea Road, McKenley Hollow, and Little Peck Hollow. In addition, the Town had damage to Burnham Hollow. Large number of debris from the storm forced Bridge Street bridge to close.	NY Rising
September 28, 2011	Flash Flood	N/A	N/A	Very heavy rain fell across Ulster County on the morning of September 28. Rainfall totals ranged from 2.6 inches in Kerhonkson to 4.63 inches in Phoenicia to 5.76 inches in West Shokan. In the hamlet of Mount Tremper, Route 212 was closed due to flooding between Route 28 and Plank Road, where the Beaver Kill feeds into the Esopus Creek. The gage on Esopus Creek at Cold Brook recorded a height of 13.3 feet (flood stage is 11 feet).	NOAA-NCDC, NWS

Dates of Events	Event Type	FEMA Declaration Number (if applicable)	Ulster County Designated?	Event Details	Source
September 18, 2012	Flood	N/A	N/A	A very powerful system brought heavy rain, strong winds, downed trees, and power lines over parts of New York State. Rainfall totals ranged from one inch to over seven inches, with the highest amounts recorded in the Eastern Catskills. The heavy rainfall in a short period of time produced flash flooding over portions of the area. In the hamlet of Oliverea, a portion of Oliverea Road was closed due to flash flooding. Flooding also washed out a recently repaired road on County Route 47, below the intersection of McKinley Hollow Road. The Esopus Creek at Cold Brook gage recorded a crest of 14.65 feet (flood stage of 11 feet).	Town of Shandaken, NOAA-NCEI, NWS
December 12, 2012	Heavy Rain and Flooding	N/A	N/A	Heavy rainfall over the eastern Catskills caused some minor river flooding. Some minor tidal flooding occurred along the Hudson River, which backed up into the Rondout Creek. In the Town of Shandaken, the Esopus Creek at Cold Brook recorded a crest of 12.4 feet (flood stage of 11 feet).	NWS, NOAA-NCEI
February 24-25, 2016	Heavy Rain, Snow Melt, and Flooding	N/A	N/A	Periods of snow and rain fell over parts of Ulster County. A warm front developed, bringing strong thunderstorms. The storms produced very heavy rain, with rainfall rates exceeding one inch per hour at times. The rainfall, combined with frozen ground in places and some snow melt, caused widespread flooding of urban, poor drainage, and low-lying areas. Some streams and rivers exceeded their flood stages. In the Town of Shandaken, the Esopus Creek at Cold Brook recorded a crest of 12.4 feet (flood stage of 11 feet).	NOAA-NCEI, NWS
January 10, 2017	Strong Wind	No	No	A cold front moved through Ulster County, bringing strong, gusty winds to the area. Wind speeds ranged from 40 to 60 mph. Roadway partially washed out.	Ulster County HMP
March 14-16, 2017	Severe Winter Storm	DR-4322	Yes	A coastal storm impacted the region from March 14–16, bringing heavy snowfall and blizzard conditions. A state of emergency was declared for New York State, and truck bans were implemented for area interstates. The Town did not experience additional losses and damages that were not listed in the summary of event.	Ulster County HMP

Dates of Events	Event Type	FEMA Declaration Number (if applicable)	Ulster County Designated?	Event Details	Source
October 29-30, 2017	Heavy Rain and Flooding	N/A	N/A	Strong storms brought heavy rain, flooding, and damaging winds to the region. Rainfall totals ranged from 2 inches in Renssealer County to 7 inches in Greene County. Over 4 inches of rain were recorded in Ulster County. In the Town of Shandaken, the Esopus Creek at Cold Brook recorded a crest of 12.2 feet (flood stage of 11 feet).	NWS
August 18, 2018	Heavy Rain and Flash Flooding	N/A	N/A	A line of storms brought rain and thunderstorms, resulting in flash flooding in some areas. Gusty winds from the storm also caused downed power lines. The Esopus Creek at Cold Brook recorded a crest of 11.8 feet (flood stage of 11 feet).	NOAA-NCEI, NWS
December 24-25, 2020	Flood	N/A	No	Heavy rain fell over the area during Christmas, causing flooding across Ulster County.	Ulster County HMP
March 12-13, 2021	Strong Winds	N/A	No	Strong winds impacted Ulster County, with gusts of up to 55 mph. This led to downed trees and power lines, damaging vehicles and trees.	Ulster County HMP
June 8, 2021	Lightning	N/A	No	Showers and thunderstorms impacted Ulster County, bringing between 1.5 and 2.5 inches of rain. Lightning struck a home in Ulster County, causing a fire.	Ulster County HMP
September 1-3, 2021	Hurrican e Ida	(EM-3572) (DR-4615)	Yes	Hurricane Ida made its way up the East Coast, through New York City, and up through Ulster County. The County experienced heavy rainfall, which left many streets, fields, and farms flooded.	Ulster County HMP
April 7-8, 2022	Flood	N/A	No	Heavy rain and widespread flooding hit eastern New York State, bringing rainfall totals of up to 4.5 inches. This heavy rainfall led to over a dozen rivers exceeding minor flood stage, with a few rivers reaching moderate flood stage. Numerous roads were closed throughout Ulster County, some of which occurred in Marbletown, Kingston, Saugerties, Stone Ridge, Rosendale, Gardiner, Wawarsing, and New Paltz. Basement flooding was also reported in Stone Ridge. Property damage totaled $50K.	Ulster County HMP

2. FLOOD INSURANCE ASSESSMENT

Flood insurance data on active policies and historical claims is a valuable source of information on the flood hazards and mitigation needs of a community. Flood insurance is available to communities that participate in the NFIP and is required as a condition for federal aid and for federally backed mortgage or loan for a building in the FEMA SFHA. This section assesses the flood insurance coverage of the Town of Shandaken.

2.1 TOWN OF SHANDAKEN FLOOD INSURANCE ASSESSMENT

Shandaken has been a regular participant in the NFIP since January 1985 and has participated in the CRS program since October 2021. Shandaken is currently a Class 8 community, which provides policy holders which a 25 percent discount on their flood insurance. This section assesses the flood insurance coverage for the Town of Shandaken and provides recommendations for coverage improvements.

For CRS Activity 370 Flood insurance coverage assessment (FIA). This credit is provided for assessing the community's current level of coverage and identifying shortcomings. The maximum credit for FIA is 15 points.

2.1.1 Coverage Assessment

The objective of CRS Activity 370 is to improve flood insurance coverage in a community through a three-step process to assess community needs. The first step in the process is to conduct a flood insurance coverage assessment (FIA) to identify a community's current level of coverage and shortcomings. The FIA element provides a maximum credit of 15 points.

Recent NFIP data was evaluated to answer questions about the coverage and areas susceptible to flooding in Shandaken. All data from this assessment was pulled from FEMA's Community Information System (CIS) on May 2, 2025. It should be noted that the paid claims data for the policies by flood zones and the Pre-Flood Insurance Rate Map (FIRM)/Post-FIRM policy data from FEMA's CIS do not match the overall Shandaken's totals. The comparison of the claims data for the policies by flood zone and the active policies and claims data for the Pre-FIRM/Post-FIRM structures with the overall Shandaken total used the totals listed in Table 2-1 as the denominator to get the percentages. The data was used to assess the following questions:

- Where do active flood insurance policies exist?
- Where have flood insurance claims have been paid in the past?
- How many buildings are exposed to flood hazards verses how many buildings have coverage?
- How does the average amount of coverage compare to the amount of expected flood damage from the 100-year flood?

Table 2-1 reflects NFIP data for Town of Shandaken by structure type. Shandaken has 137 active policies, and 95.6 percent are for residential structures (131). The most of these residential policies are for single-family structures (125). Residential structures also make up most of the paid claims with 251. This is 90.3 percent of the 278 paid claims. Single-family structures have the most paid claims with 125. Shandaken has a total of $5,853,423.41 in paid claims. A total of $5,443,533.70 of the paid claims are for residential structures and most of these are for single-family structures ($5,409,016.30). Non-residential structures make up only 97.12 percent of the paid claims but have 70 percent of the total amount of paid claims ($409,889.71).

Table 2-1. Total Shandaken NFIP Policy and Claims by Building Occupancy Type

Occupancy	Number of Policies in Force	Total Premium	Insurance in Force	Number of Closed Paid Losses	Total of Closed Paid Losses
Single-Family	125	$184,166	$32,623,000	245	$5,409,016.30
2-4 Family	4	$6,627	$1,175,000	6	$34,517.40
All Other Residential	2	$1,692	$658,000	0	$0.00
Non-Residential	6	$26,018	$2,169,000	27	$409,889.71
Total	**137**	**$218,503**	**$36,625,000**	**278**	**$5,853,423.41**

Source: FEMA Community Information System as of 5/2/2025

Table 2-2 reflects NFIP data for the Town of Shandaken categorized by FEMA flood zone. The data shows that B, C, and X zones have 77 policies which is 56.2 percent of the total policies (137). When looking at the policies in the SFHA, there are 60 active polices located in the SFHA which is 43.79 percent of the total active policies (137). Most of the SFHA policies are located in the A1-30 & AE zones with 55 policies.

Table 2-2. Total Shandaken NFIP Policy and Claims by Flood Zone

Flood Zone	Number of Policies	Total Premium	Total Coverage	Number of Closed Paid Losses	Total of Closed Paid Losses
SFHA Zones					
A1-30 and AE Zones	55	$131,057	$11,722,000	81	$1,856,946.15
A Zones	5	$11,746	$1,065,000	70	$1,033,672.99
AO Zones	0	$0	$0	0	$0.00
AH Zones	0	$0	$0	0	$0.00
AR Zones	0	$0	$0	0	$0.00
A99 Zones	0	$0	$0	0	$0.00
V Zones	0	$0	$0	0	$0.00
D Zones	0	$0	$0	0	$0.00
B, C, and X Zone					
Standard	77	$75,700	$23,838,000	59	$59,109.64
Preferred	0	$0	$0	43	$62,138.67
Total	**137**	**$218,503**	**$36,625,000**	**253**	**$264,799.02**

Source: FEMA Community Information System as of 5/2/2025

When comparing the number of paid claims for Shandaken (278) to the paid claims based on flood zone, the paid claims are split between the SFHA (60) and the B, C, and X zones (77). This represents 21.6 percent (SFHA) and 27.7 percent (B, C, and X zones) of the total number of paid claims, respectively. Most of the SFHA paid claims are in the A1-30 and AE zones with 81. Policies in the SFHA have the highest number of paid claims with $1,856,946.15, while the B, C, and X zones have $121,248.31.

Table 2-3 reflects NFIP data for the Pre-FIRM structures in Shandaken. For Shandaken, Pre-FIRM structures are those built before 9/14/1979. Shandaken has 118 active policies for Pre-FIRM structures, which make up 46.5 percent of the total active policies in Shandaken (254). When looking at the flood zones, most of the active Pre-FIRM policies are in the B, C, and X zones with 65, which is 55.1 percent of the active Pre-FIRM policies (118).

There are 49 active Pre-FIRM policies located in the A1-30 & AE zones, representing 41.5 percent of the Pre-FIRM policies.

Table 2-3. Shandaken NFIP Policy and Claim Data for Pre-FIRM Structures

Flood Zone	Number of Policies	Total Premium	Total Coverage	Number of Closed Paid Losses	Total of Closed Paid Losses
SFHA Zones					
A1-30 and AE Zones	49	$125,532	$9,608,000	78	$1,747,573.33
A Zones	4	$10,212	$880,000	69	$1,029,012.49
AO Zones	0	$0	$0	0	$0.00
AH Zones	0	$0	$0	0	$0.00
A99 Zones	0	$0	$0	0	$0.00
V Zones	0	$0	$0	0	$0.00
D Zones	0	$0	$0	0	$0.00
B, C, and X Zone	65	$67,132	$19,910,000	90	$2,524,789.75
Standard	65	$67,132	$19,910,000	57	$1,496,438.13
Preferred	0	$0	$0	34	$1,097,410.90
Total	**118**	**$202,876**	**$30,398,000**	**237**	**$5,301,375.57**

Source: FEMA Community Information System as of 5/2/2025

Table 2-4 reflects the number of policies for post-FIRM structures in Shandaken. For Shandaken, post-FIRM structures are those built after 9/14/1979. Shandaken has six active policies for post-FIRM structures, which make up 35.3 percent of the total active post-FIRM policies (17). When looking at the flood zones, most of the active post-FIRM policies are for structures located in the B, C, and X zones with 11 policies, representing 64.7 percent of the total post-FIRM policies.

Post-FIRM policies have a total of 15 paid claims, which is 6.0 percent of the total paid claims for Shandaken (252). When looking at the flood zones, the policies located in the B, C, and X zones have the most with 11 claims, which is 73.3 percent of the total post-FIRM claims. The SFHA policies have 6 claims, representing 40.0 percent of the total post-FIRM claims. The amount of post-FIRM claims is $517,917.50, of which most are for policies located in the B, C, and X zones with $403,884.18. The post-FIRM policies in the SFHA have a total of $114,033.32 in paid claims.

Table 2-4. Shandaken NFIP Policy and Claim Data for Post-FIRM Structures

Flood Zone	Number of Policies	Total Premium	Total Coverage	Number of Closed Paid Losses	Total of Closed Paid Losses
SFHA Zones					
A1-30 and AE Zones	5	$6,387	$2,129,000	3	$109,372.82
A Zones	1	$1,534	$185,000	1	$4,660.50
AO Zones	0	$0	$0	0	$0.00
AH Zones	0	$0	$0	0	$0.00
A99 Zones	0	$0	$0	0	$0.00
V Zones	0	$0	$0	0	$0.00
D Zones	0	$0	$0	0	$0.00
B, C, and X Zone	11	$11,549	$3,578,000	11	$403,884.18

Flood Zone	Number of Policies	Total Premium	Total Coverage	Number of Closed Paid Losses	Total of Closed Paid Losses
Standard	11	$11,549	$3,578,000	2	$3,632.13
Preferred	0	$0	$0	9	$400,252.05
Total	**17**	**$19,470**	**$5,892,000**	**15**	**$517,917.50**

Source: FEMA Community Information System as of 5/2/2025

2.1.2 Level of Flood Insurance Coverage

Table 2-5 compares the number of active policies in the SFHA to the number of buildings located in the SFHA. The data on the number of active policies in the SFHA was collected from FEMA's CIS and the number of buildings located in the SFHA was determined in the 2025 Shandaken Floodplain Management Plan. Shandaken has a total of 137 active policies in the SFHA and 451 buildings in the SFHA. The insurance coverage rate for buildings in the SFHA is 39.6 percent.

Table 2-5. Percent of Shandaken Buildings Insured in the SFHA

Flood Zone	Number of Policies in Force	Number of Buildings	Percent Insured
SFHA	137	451	30.4%

Source: FEMA Community Information System as of 5/2/2025; 2025 Shandaken Floodplain Management Plan

2.1.3 Conclusion

The following conclusions can be drawn from the flood insurance and building data reported above:

- Residential structures represent a majority of the active policies and paid claims in the Town. Within this category, single-family residential structures account for the largest share of active policies, and paid claims show that this structure type is central to the community's insured and historical flood loss profile.
- In addition to accounting for the majority of active policies and paid claims, residential structures, specifically single-family residential structures, also account for the greatest amount of paid claims. This indicates that residential structures and more specifically single-family residential structures have the greatest vulnerability and financial losses for the Town.
- Structures located in the B, C, and X Zones have most of the active policies while structures located in the SFHA have most of the paid claims. This suggests that property owners in the SFHA underestimate their flood risk.
- Interestingly, while the B, C, and X Zones have the majority of the active policies and the SFHA has the majority of the paid claims, the amount of paid claims are nearly equally split between the B, C, and X Zones and the SFHA. This suggests that while structures located outside of the SFHA experience fewer flood events, they have higher losses if they do experience a flood.

2.1.4 Recommendations

The following recommendations are intended to support the improved flood insurance coverage for the Town of Shandaken:

- Launch a public education initiative aimed at increasing awareness of flood risk, insurance availability, and possible mitigation strategies. This initiative should target the structures located in both the SFHA and non-SFHA areas to increase the number of active policies in the SFHA and reduce the flood risk and losses in both zones.

2.1.5 Governing Body Submittal

The assessment document (containing only general or aggregated data or maps) must be submitted to the community's governing body. No action is needed by the governing body for a stand-alone FIA report. The objective is to inform the elected leaders about flood insurance coverage. They may opt to take the next step, which is to prepare a plan to improve coverage. The Town of Shandaken RLAA was submitted to the governing body on _____. Documentation of the adopting resolution for this report can be found in Appendix A.

2.1.6 Reassessment

Updated flood insurance data must be obtained five years after the assessment was done. The new information is used to update the level of coverage and the recommendations. The document is revised accordingly and submitted to the community's governing body. No action is needed by the governing body.

3. REPETITIVE LOSS AREAS OUTREACH

3.1 CRS OUTREACH REQUIREMENTS FOR RLAA

RLAA Step 1 (2025 CRS Coordinator's Manual Section 512.b) requires notification that an analysis is being conducted to all properties in the repetitive loss areas, with a request for input on the hazard and recommended actions. The notice (or any public document) must not identify which properties are on FEMA's repetitive loss list. There are no restrictions on publicizing what properties are in repetitive loss areas that have more than one property, and there are no restrictions on publishing aggregate data, such as how many properties received claims or the average value of those claims. Planning staff may share insurance claim information with the owner of a property but may not make it available to anyone else.

- The notice can be sent to owners OR residents, at the community's discretion, as long as a representative of each property is notified.
- The notice cannot be done via a newspaper or newsletter notice or article.
- The notice must advise the recipients when and how copies of the draft report can be obtained and ask for their comments on the draft.

Several methods were deployed to engage repetitive loss area property owners during the course of this RLAA process. This chapter highlights those efforts for RLAA Step 1 and RLAA Step 2.

3.2 RLAA OUTREACH – STEP 1

This RLAA is considered by the Town of Shandaken to be a stand-alone analysis for CRS purposes. The outreach effort used to develop the RLAA update included properties in the repetitive loss areas and provided a tangible benefit to the RLAA effort. This section provides an overview of the outreach conducted for the RLAA. Step 1: Advise all the property owners in the repetitive loss areas that the analysis will be conducted and request their input on the hazard and recommendation actions.

RLAA Step 1 was satisfied by completion of the following outreach efforts. Each outreach project summarized the RLAA update effort, encouraged citizen engagement related to flooding sources and property mitigation actions, and identified the hyperlink to the Flood Information page where the survey and draft plan could be accessed.

- The owners and residents of repetitive loss properties in Town of Shandaken were notified using a physical hard copy mailer, included in Appendix B and in Section 3.5.
- The Town hosted a public open house on August 25, 2025, as a citizen engagement opportunity.
- The RLAA citizen engagement survey was posted on the Town's Flood Information web page for citizen engagement.
- The draft plan was posted on the Town's Flood Information web page and available for public review and comment.

3.3 CONTACT WITH AGENCIES AND ORGANIZATIONS – RLAA STEP 2

RLAA Step 2 requires contact with agencies or organizations that may have plans or studies that could affect the cause or impact of the flooding. The analysis report must identify contacted agencies and organizations. The

following agencies were invited to participate in the planning process from the beginning and were kept apprised of plan development milestones. During this engagement, additional plans or studies were not received by the agencies contacted. Contact records for Step 2 are referenced in Appendix E.

- Ashokan Watershed Stream Management Program
- NYS Department of Environmental Conservation
- Ulster County Department of the Environment
- Ulster County Soil and Water Conservation District
- Cornell Cooperative Extension of Ulster County
- Ulster County Emergency Services Department
- NYC Department of Environmental Protection
- Catskill Watershed Corporation
- RCAP Solutions

These agencies participated in the SAFARI received meeting announcements, meeting agendas, and meeting minutes by email or in-person throughout the RLAA development process or they received an email requesting their input to provide any plans, documents, or studies could affect the cause or impacts of the flooding. SAFARI is a multi-agency group that meets monthly to discuss floodplain, floodplain development, and floodplain planning topics related to local, state, and federal standards.

3.4 STRATEGY

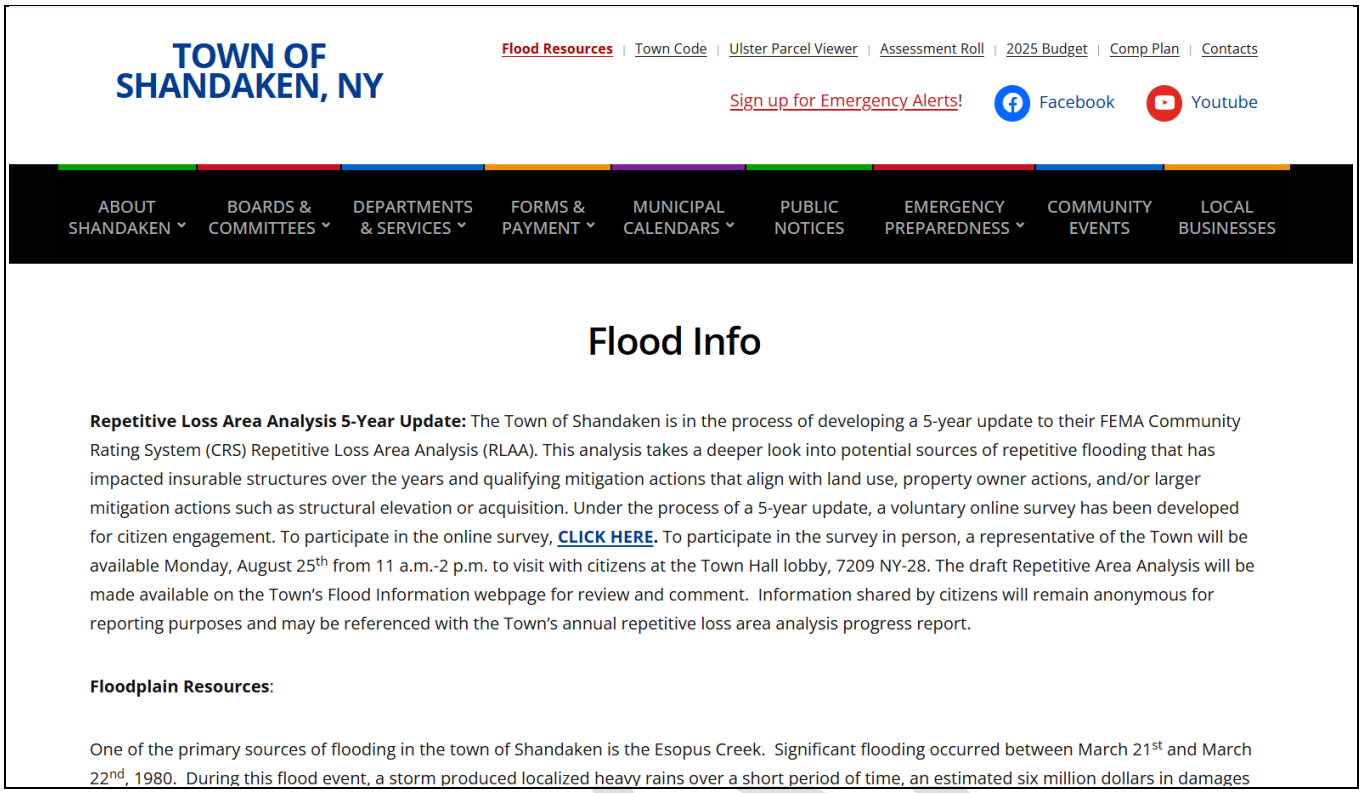
The strategy for involving the public in developing the RLAA emphasized the following elements:

- Attempt to reach as many citizens as possible using multiple media.
- Use a survey to determine public perception of flood risk and support of mitigation actions.
- Identify and involve stakeholders.
- Conduct a public open house meeting to invite the public's input.
- Shandaken Area Flood Assessment and Remediation Initiative (SAFARI) Group.

3.4.1 Website

The Town of Shandaken's website (http://www.shandaken.us/flood-mitigation-plan/flood-mitigation-plan-post/), serves as a key resource for flood risk information and mitigation efforts. The Flood Mitigation Plan page provides updates on strategies to reduce flood hazards, including annual progress reports on over 50 initiatives like infrastructure upgrades, stream restorations, and relocating critical facilities. It documents recent flood events, risk changes, and success stories such as home elevations and embankment repairs. Oversight by the SAFARI committee ensures the plan stays current. The site promotes transparency, public awareness, and active engagement in flood preparedness.

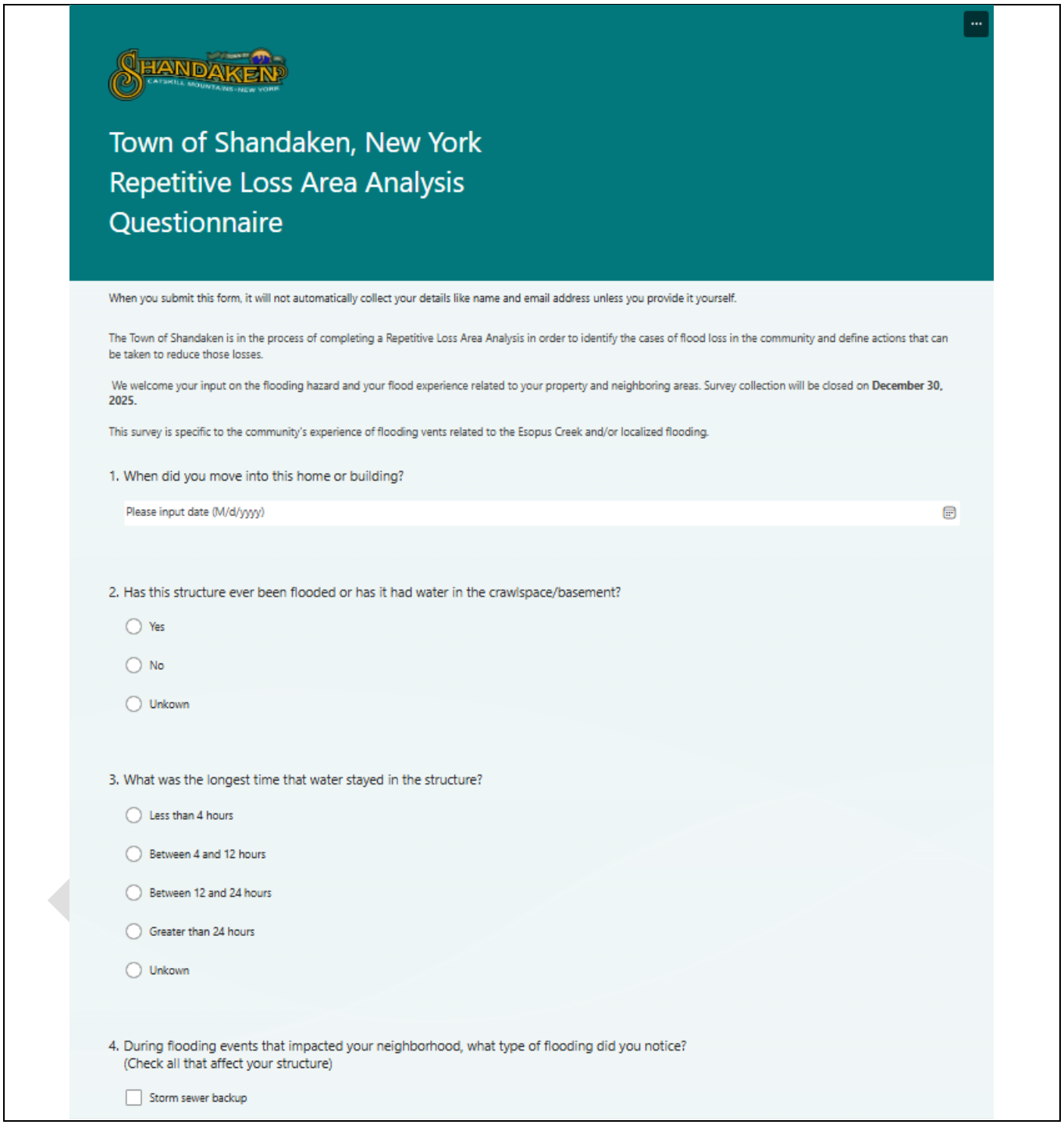
Figure 3-1. Sample Page from Floodplain Management Plan Web Site



3.4.2 Survey

A survey (see Figure 3-2) was developed by the planning team with guidance from the Planning Committee. The survey was used to gauge household preparedness for the flood hazard and the level of knowledge of tools and techniques that assist in reducing risk and loss from flooding. This survey was designed to help identify areas vulnerable to floods. This feedback helped guide the Planning Committee in affirming the goals and objectives identified during the planning process and in selecting repetitive loss area action items.

Figure 3-2. Sample Page from Survey Distributed to the Public



Town of Shandaken, New York
Repetitive Loss Area Analysis
Questionnaire

When you submit this form, it will not automatically collect your details like name and email address unless you provide it yourself.

The Town of Shandaken is in the process of completing a Repetitive Loss Area Analysis in order to identify the cases of flood loss in the community and define actions that can be taken to reduce those losses.

We welcome your input on the flooding hazard and your flood experience related to your property and neighboring areas. Survey collection will be closed on **December 30, 2025.**

This survey is specific to the community's experience of flooding vents related to the Esopus Creek and/or localized flooding.

1. When did you move into this home or building?

Please input date (M/d/yyyy)

2. Has this structure ever been flooded or has it had water in the crawlspace/basement?

- Yes
- No
- Unkown

3. What was the longest time that water stayed in the structure?

- Less than 4 hours
- Between 4 and 12 hours
- Between 12 and 24 hours
- Greater than 24 hours
- Unkown

4. During flooding events that impacted your neighborhood, what type of flooding did you notice? (Check all that affect your structure)

- Storm sewer backup

Multiple methods were used to solicit survey responses:

- A web-based version of the survey was made available on the plan website.
- The survey was advertised in several public Town Board meetings (televised).
- Mailings to residents notify them of public meetings included links to the online survey.
- A flyer was prepared advertising the survey.

- Individual Steering Committee members contacted organizations to request that they publicize the link to the online survey; the following outlets were contacted in this way:
  - Facebook posts advertising RLAA survey and Public Meeting.
  - Public Cable Channel – Streaming Public Meeting.
  - Public Cable Channel – Public Service Announcement requesting RLAA input.

A web-based version was available on the plan website. Although the number of surveys completed (2) is not sufficient to establish statistical trends, the responses provided valuable feedback to use in the planning process. The complete survey and a summary of its findings can be found in Appendix C.

3.4.3 Public Involvement Results

Survey Outreach

The survey was completed by two respondents. A summary of the results is provided below:

- Two respondents:
  - Both have been flooded.
    - One respondent had experienced up to 3 feet of water at some point.
    - Both respondents stated their properties were not insured.
- Open-ended comments:
  - Some river overflow concerns.
  - Some homes indicated mitigation efforts:
    - Elevating utilities
    - Re-graded yard to keep water away
    - Added a sump pump

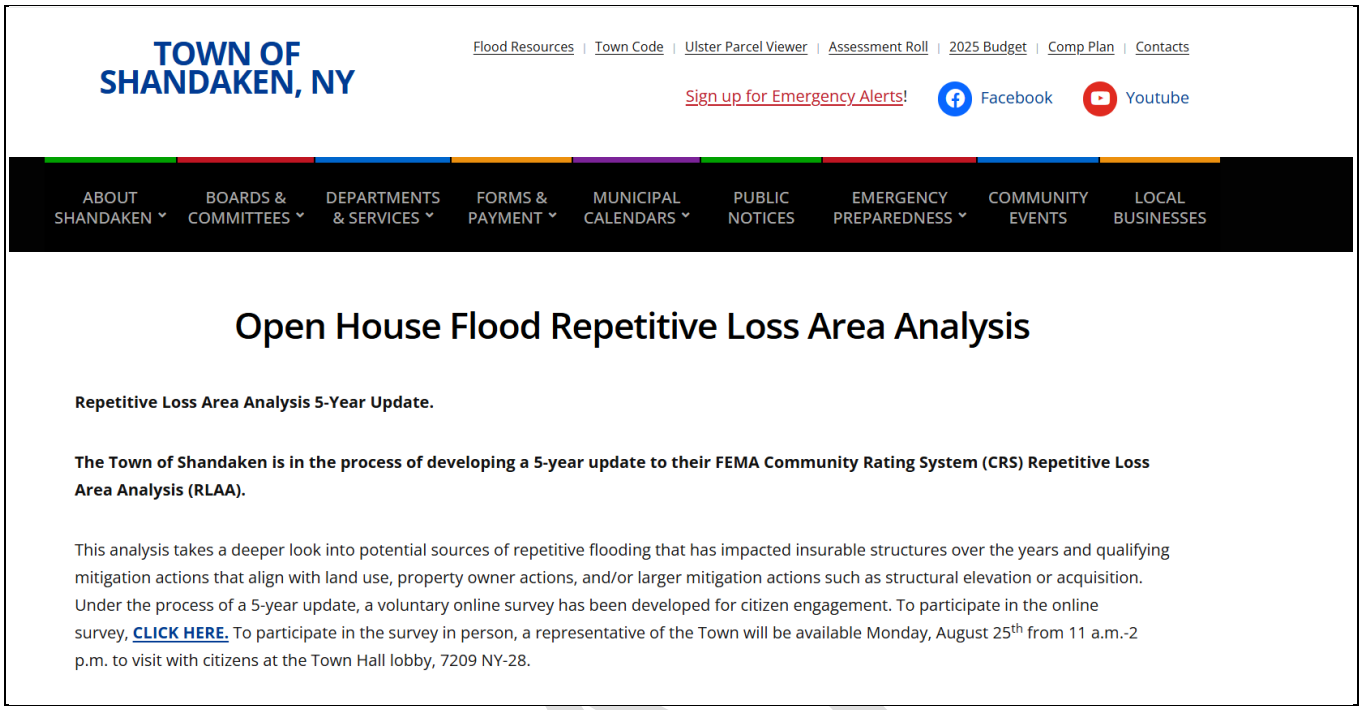
Public Open House Meeting

The Town of Shandaken held a public open house meeting on August 25, 2025, and posted an announcement on their website (see Figure 3-3). The public was invited to attend the public open house meeting to be assisted with any questions they may have, and there was an opportunity to complete the voluntary online public survey in-person. The public open house was advertised in the RLAA Step 1 informational mailer and posted on the Town's Flood Information web page.

The public open house was hosted by Heidi May Emrich, CFM, Senior Environmental Planner, Ulster County Department of the Environment and Peter DiSclafani, Supervisor, Town of Shandaken. Open house was facilitated at the Town Hall lobby from 11 a.m. to 2 p.m. There was not any citizen participation or engagement received for this outreach effort, but a sign-in sheet of the staff who participated can be found in Appendix C.

The Town's RLAA survey link will remain open on the Flood Information web page and utilized to support future 510 RLAA annual progress reports.

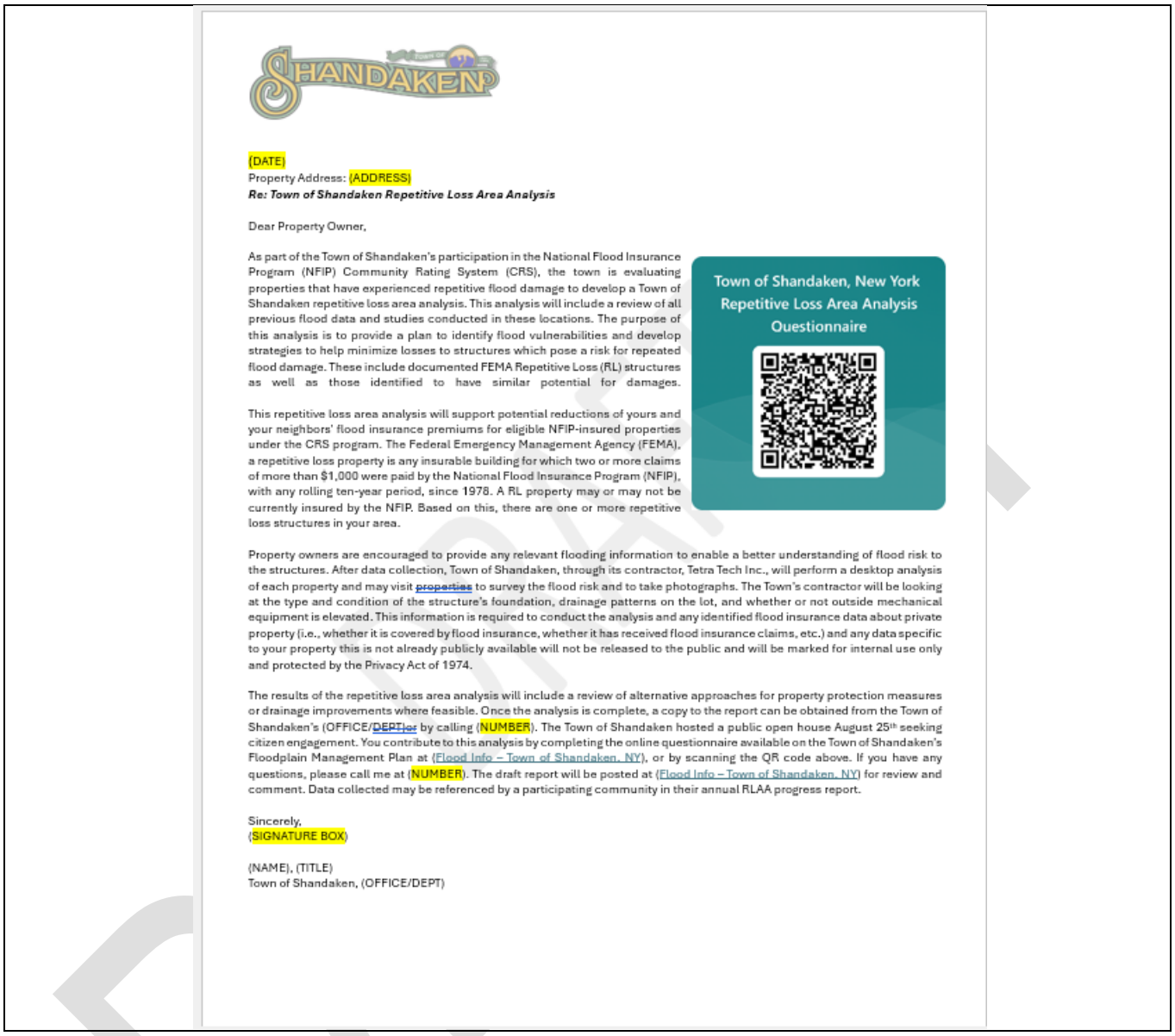
Figure 3-3 Open House Flood RLAA Website Announcement



3.5 REPETITIVE LOSS AREA SPECIFIC OUTREACH

Upon initiation of the RLAA, the Town of Shandaken disseminated 171 letters to property owners within the 11 repetitive loss areas informing them of this effort, provided a survey link to enable comments and providing the web link to the location of the report to enable review and comment. The communication document is shown in Figure 3-4.

Figure 3-4. Repetitive Loss Area Target Mailing



(DATE)
Property Address: (ADDRESS)
Re: Town of Shandaken Repetitive Loss Area Analysis

Dear Property Owner,

As part of the Town of Shandaken's participation in the National Flood Insurance Program (NFIP) Community Rating System (CRS), the town is evaluating properties that have experienced repetitive flood damage to develop a Town of Shandaken repetitive loss area analysis. This analysis will include a review of all previous flood data and studies conducted in these locations. The purpose of this analysis is to provide a plan to identify flood vulnerabilities and develop strategies to help minimize losses to structures which pose a risk for repeated flood damage. These include documented FEMA Repetitive Loss (RL) structures as well as those identified to have similar potential for damages.

Town of Shandaken, New York
Repetitive Loss Area Analysis
Questionnaire

This repetitive loss area analysis will support potential reductions of yours and your neighbors' flood insurance premiums for eligible NFIP-insured properties under the CRS program. The Federal Emergency Management Agency (FEMA), a repetitive loss property is any insurable building for which two or more claims of more than $1,000 were paid by the National Flood Insurance Program (NFIP), with any rolling ten-year period, since 1978. A RL property may or may not be currently insured by the NFIP. Based on this, there are one or more repetitive loss structures in your area.

Property owners are encouraged to provide any relevant flooding information to enable a better understanding of flood risk to the structures. After data collection, Town of Shandaken, through its contractor, Tetra Tech Inc., will perform a desktop analysis of each property and may visit ~~properties~~ to survey the flood risk and to take photographs. The Town's contractor will be looking at the type and condition of the structure's foundation, drainage patterns on the lot, and whether or not outside mechanical equipment is elevated. This information is required to conduct the analysis and any identified flood insurance data about private property (i.e., whether it is covered by flood insurance, whether it has received flood insurance claims, etc.) and any data specific to your property this is not already publicly available will not be released to the public and will be marked for internal use only and protected by the Privacy Act of 1974.

The results of the repetitive loss area analysis will include a review of alternative approaches for property protection measures or drainage improvements where feasible. Once the analysis is complete, a copy to the report can be obtained from the Town of Shandaken's (OFFICE/~~DEPT~~)or by calling (NUMBER). The Town of Shandaken hosted a public open house August 25th seeking citizen engagement. You contribute to this analysis by completing the online questionnaire available on the Town of Shandaken's Floodplain Management Plan at (Flood Info – Town of Shandaken, NY), or by scanning the QR code above. If you have any questions, please call me at (NUMBER). The draft report will be posted at (Flood Info – Town of Shandaken, NY) for review and comment. Data collected may be referenced by a participating community in their annual RLAA progress report.

Sincerely,
(SIGNATURE BOX)

(NAME), (TITLE)
Town of Shandaken, (OFFICE/DEPT)

4. RELEVANT PROGRAMS AND REGULATIONS

This chapter provides a comprehensive review of existing laws, ordinances, and plans at the federal, state, and local level that can support or impact action items identified in this RLAA. Federal, state, and local agencies share and coordinate responsibilities for flood protection in the Town of Shandaken. Agencies supporting flood management and mitigation include federal agencies (the U.S. Army Corps of Engineers, which implements federal flood protection policies, and FEMA); state agencies including the NY Department of Conservation which is responsible for managing the state's waterways, County departments such as the Ulster County Department of Environmental Conservation, and local town departments including the Town of Shandaken Department of Public Works which support the reduction of flood risk in the Town.

The development of the RLAA included a review and incorporation, if appropriate, of existing plans, studies, reports, and technical information as part of the planning process. Pertinent federal, state, and local laws are described below.

4.1 FEDERAL

4.1.1 National Flood Insurance Program

Established in 1968, the NFIP makes federally backed flood insurance available to homeowners, renters, and business owners in participating communities that enact floodplain regulations. For most participating communities, FEMA has prepared a detailed Flood Insurance Study. The study presents water surface elevations for floods of various magnitudes, including the 1 percent annual chance flood (called the 100-year flood or base flood) and the 0.2-percent annual chance flood (the 500-year flood). Base flood elevations and the boundaries of the 100- and 500-year floodplains are shown on FIRMs, which are the principle tool for identifying the extent and location of the flood hazard. FIRMs are the most detailed and consistent data sources available, and for many communities, they represent the minimum area of oversight under their floodplain management program.

Participants in the NFIP must, at a minimum, regulate development in floodplain areas in accordance with NFIP criteria. Before issuing a permit to build in a floodprone area, participating jurisdictions must, at a minimum, ensure that the project meets the following criteria (44 CFR Part 60, Section 60.3):

- Be designed (or modified) and adequately anchored to prevent flotation, collapse, or lateral movement of the structure resulting from hydrodynamic and hydrostatic loads, including the effects of buoyancy.
- Be constructed with materials resistant to flood damage.
- Be constructed by methods and practices that minimize flood damage.
- Be constructed with electrical, heating, ventilation, plumbing, and air conditioning equipment and other service facilities that are designed or located so as to prevent water from entering or accumulating within the components during conditions of flooding.

Additional criteria apply depending on the availability of information about the flood hazard.

The Town of Shandaken participates in the NFIP and has adopted regulations that meet the NFIP requirements. The Town entered the NFIP in 1980, and the first FIRM for the Town was issued on January 17, 1985. Structures permitted or built before then are called "pre-FIRM" structures, and structures built afterward are called "post-

FIRM." The insurance rate is different for the two types of structures. The effective date for the current FIRM is November 18, 2016. Shandaken is currently in good standing with the provisions of the NFIP.

The Town of Shandaken floodplain administrator is Mr. Robert Stanley, who has been involved in this planning process, providing specific flood-related information and mitigation initiatives, as well as providing review and input on the planning documents.

4.1.2 The Community Rating System

The CRS is a voluntary program within the NFIP that encourages floodplain management activities that exceed the minimum NFIP requirements. Flood insurance premiums are discounted to reflect the reduced flood risk resulting from community actions to meet the CRS goals of reducing flood losses, facilitating accurate insurance rating, and promoting awareness of flood insurance.

For participating communities, flood insurance premium rates are discounted in increments of 5 percent. For example, a Class 9 community would receive a 5 percent premium discount, a Class 8 community would receive a 10 percent premium discount, and so on, until reaching a 45 percent premium discount for a Class 1 community. (Class 10 communities are those that do not participate in the CRS; they receive no discount.)

The CRS classes for local communities are based on 18 creditable activities in the following categories:

- Public information
- Mapping and regulations
- Flood damage reduction
- Flood preparedness

CRS activities can help to save lives and reduce property damage. Communities participating in the CRS represent a significant portion of the nation's flood risk; over 66 percent of the NFIP's policy base is located in these communities. Communities receiving premium discounts through the CRS range from small to large and represent a broad mixture of flood risks, including both coastal and riverine flood risks. As a federal program, applicable standards apply to CRS-participating communities. The following sections are examples of federal aspects of development within a floodplain.

Section 507: Compliance with Provisions for Environmental and Historic Preservation

Federal actions and undertakings, including ongoing programs, must comply with applicable federal environmental and historic preservation laws, implementing regulations, and executive orders. The CRS is a federal program, and FEMA has identified certain building or land-altering activities that must meet this requirement if they are to be considered for CRS credit. These include projects undertaken under Activity 520 (Acquisition and Relocation), Activity 530 (Flood Protection), Activity 540 (Drainage System Maintenance), and Activity 620 (Levees).

The level of environmental and historic preservation compliance and documentation required for each project is determined by the type of project and the source of its funding. For CRS purposes, a project falls into one of these two categories:

- Projects funded (in whole or in part) by a federal agency
- Projects funded by a state and/or local government.

NOTE: Using any amount of federal or FEMA funding (including using it as a match for a locally sponsored project) has the effect of bringing that project into the "federally funded" category. For any such project, therefore, all the federal environmental and historic preservation requirements must be met.

Self-certification is provided through the completion of Community Certifications of Compliance with Environmental and Historic Preservation Requirements (CC-EHPs). The CC-EHP forms can be downloaded from www.CRSresources.org/500, or requested from the ISO/CRS Specialist.

- Certifications are required for all projects in Activity 520 (Acquisition and Relocation) and Activity 530 (Flood Protection) that were permitted or initiated after the implementation of the 2013 Coordinator's Manual.
- Certifications are required at each verification visit for the ongoing maintenance programs credited under Activity 540 (Drainage System Maintenance) and Activity 620 (Levee Maintenance).
- Projects funded by FEMA are considered to meet FEMA's environmental and historic preservation compliance requirements. A summary of such projects needs to be included in the Community Certifications.

If a community is not able to provide the information needed to certify that compliance occurred before implementation of the project or activity, then CRS credit will not be provided for that project or for that element of a CRS Activity.

507.a. Activity 520 (Acquisition and Relocation) and Activity 530 (Flood Protection)

The CC-EHPs, certifying compliance with the appropriate requirements, are required for all projects credited under Activity 520 or Activity 530 that were implemented AFTER the effective date of the 2013 Coordinator's Manual (April 1, 2013). They are not required for projects that were implemented before the 2013 Coordinator's Manual became effective, including projects that received CRS credit under an earlier Coordinator's Manual.

Projects funded in whole or in part by FEMA are considered to have already complied with FEMA's environmental and historic preservation requirements. A summary description of these projects needs to be documented in the CC-EHPs.

507.b. Activity 540 (Drainage System Maintenance) and Activity 620 (Levees)

The CC-EHPs certifying compliance with the appropriate requirements must be submitted at the time that CRS credit is requested for projects under Activities 540 or 620. This includes the first time that Activity 540 or Activity 620 credit is requested as well as each subsequent verification visit at which continued credit is requested.

507.c. More Information on Environmental Compliance

The CC-EHPs consist of CC-520EHP, CC-530EHP, CC-540EHP, and CC-620EHP. They can be downloaded from www.CRSresources.org/500 and www.CRSresources.org/600, or requested from the ISO/CRS Specialist.

A matrix of the various requirements for environmental and historic preservation compliance as they relate to CRS-credited projects is posted at www.CRSresources.org/500.

Figure 500-4 summarizes the applicable federal requirements for environmental and historic preservation. For more information about FEMA's preservation policies, visit www.fema.gov/environmental-planning-and-historic-preservation-program.

Figure 500-4. Summary of FEMA's policy on environmental and historic preservation.

It is FEMA's policy to act with care to ensure that its disaster response and recovery, mitigation and preparedness responsibilities are carried out in a manner that is consistent with all Federal environmental and historic preservation policies and laws. FEMA uses all practical means and measures to protect, restore and enhance the quality of the environment, to avoid or minimize adverse impacts to the environment, and to attain the objectives of

- Achieving use of the environment without degradation or undesirable and unintended consequences;
- Preserving historic, cultural, and natural aspects of national heritage and maintaining, wherever possible, an environment that supports diversity and variety of individual choice;
- Achieving a balance between resource use and development within the sustained carrying capacity of the ecosystem involved; and

Figure 500-5 gives brief descriptions of applicable federal environmental laws and executive orders, along with links to websites that offer more information.

Communities are encouraged to learn more about federal, state, and other programs for the protection of environmental, cultural, and historic resources. Many of the principles and techniques used by such programs can be incorporated into the community's floodplain management efforts and thereby help to reduce flood losses and sustain the natural functions of floodprone areas.

Figure 500-5 Federal Environmental Laws and Executive Orders that may Apply to some CRS-Related Activities

Archeological & Historic Preservation Act

Requires federal agencies to take into account the preservation of cultural resources that may be damaged by federal or federally authorized construction activities. Requires that the U.S. Secretary of Interior be notified when unanticipated archeological materials are discovered during construction of a federal undertaking.

Administered by: State Historic Preservation Officer, Tribal Historic Preservation Officer, National Park Service

For more information: www.nps.gov/archeology/tools/Laws/ahpa.htm www.achp.gov/nhpa.html

Clean Water Act, Section 402

Limits the quantity of pollutants that may be discharged into surface waters. Includes permits for municipal separate storm sewer discharges. National Pollution Discharge Elimination System (NPDES) discharge permits may be required from the U.S. Environmental Protection Agency or the state.

Administered by: State agency for water quality in states with delegated regulatory responsibility; otherwise, U.S. Environmental Protection Agency

For more information: http://water.epa.gov/lawsregs/guidance/wetlands/section402.cfm

Clean Water Act, Section 404 (Nationwide Permit 13) Requires a permit for bank stabilization projects less than 500 feet long and being implemented solely for erosion protection.

Administered by: U.S. Army Corps of Engineers, U.S. Environmental Protection Agency

For more information: www.usace.army.mil/ (see “Regulatory permits—Obtain a permit”) https://www.epa.gov/cwa-404/section-404-permit-program

Clean Water Act, Section 404 (Section 404 permit) Establishes permit requirements for actions to discharge dredge or fill material into waters of the United States, including wetlands. Includes fill for development and for water resources projects such as dams and levees. Administered by: U.S. Army Corps of Engineers, U.S. Environmental Protection Agency For more information: www.usace.army.mil/ (see “Regulatory permits—Obtain a permit”), https://www.epa.gov/cwa-404/section-404-permit-program www.fws.gov/wetlands

Coastal Barrier Resources Act Prohibits new federal expenditures or financial assistance for development within an established unit or zone of the Coastal Barrier Resources System. Protects ecologically sensitive coastal barriers along the U.S. Atlantic, Gulf, and Great Lakes coasts.

Administered by: U.S. Fish & Wildlife Service field offices

For more information: www.fws.gov/CBRA

Coastal Zone Management Act Requires federal agencies conducting or supporting projects affecting the coastal zone to conduct and support those activities to the maximum extent possible in a manner consistent with the state’s approved coastal management plan. Requires a “consistency determination” for federal actions. Action-taking entities are required to obtain a permit from the state’s lead coastal resources management agency or office.

Administered by: State’s lead coastal management agency, National Oceanic and Atmospheric Administration

For more information: https://coast.noaa.gov/czm/about/

Endangered Species Act

Prevents or requires modification of a project that could jeopardize endangered or threatened species and/or their habitat. Section 7 requires consultation with the U.S. Fish and Wildlife Service and/or National Marine Fisheries Service, as applicable.

Administered by: U.S. Fish and Wildlife Service, National Marine Fisheries Service, applicable state agencies for state-protected species and their habitat

For more information: www.fws.gov/endangered/ www.nmfs.noaa.gov/pr/permits

Figure 500-5 (cont.) Federal Environmental Laws and Executive Orders that may Apply to some CRS-Related Activities

Executive Order 11988—Floodplain Management

Requires federal agencies to avoid, to the extent possible, the long- and short-term adverse impacts associated with the occupance and modification of floodplains. Requires federal agencies to avoid the direct and indirect support of floodplain development where there is a practicable alternative.

Administered by: Federal Emergency Management Agency

For more information: https://www.fema.gov/executive-order-11988-floodplain-management

Executive Order 11990—Protection of Wetlands

Requires federal agencies to minimize, to the fullest extent possible, the destruction, loss, or degradation of wetlands. Requires federal agencies to preserve and enhance the natural and beneficial values of wetlands.

Administered by: U.S. Fish and Wildlife Service

For more information: www.fws.gov/wetlands

Executive Order 12898—Environmental Justice for Low Income and Minority Populations

Requires fair treatment of all ethnic and income groups regarding public health and environmental effects from federal agency laws, regulations, policies, programs, and projects. Requires federal agencies to address disproportionately high and adverse human health or environmental effects on minority populations and low-income populations.

Administered by: All federal agencies

Farmlands Protection Policy Act

Requires federal agencies to minimize the extent to which federal programs contribute to the unnecessary and irreversible conversion of farmland to non-agricultural uses.

Administered by: Natural Resources Conservation Service state office, state agencies for soils (soil and water conservation districts) For more information: www.nrcs.usda.gov/programs/fppa/

Fish and Wildlife Coordination Act

Requires federal agencies to consider the effects that projects may have on fish and wildlife resources, take action to prevent loss or damage to these resources, and support the development or improvement of these resources. Protects fish and wildlife when federal actions result in the control or modification of natural streams, waterways, water bodies, or associated wetlands.

Administered by: U.S. Fish and Wildlife Service, National Marine Fisheries Service

For more information: www.fws.gov/Landscape-Conservation/index.html www.habitat.noaa.gov/index.html

National Historic Preservation Act

Section 106 of the NHPA requires federal agencies to take into account the impact of their actions on historic properties listed (or eligible for listing) on the National Register of Historic Places.

Administered by: State Historic Preservation Officer, Tribal Historic Preservation Officer, Advisory Council on Historic Preservation, National Park Service

For more information: www.achp.gov/overview.html www.achp.gov/nhpa.html www.nps.gov/subjects/historicpreservation/index.htm

Rivers and Harbors Act,-Section 10

Requires a permit for building any structure in the channel or along the banks of navigable waters of the United States that changes the course, conditions, location, or capacity of those waters.

Administered by: U.S. Army Corps of Engineers

For more information: www.usace.army.mil/Missions/Civil-Works/Section408/ www.uscg.mil/hq/cg5/cg551/

4.1.3 Disaster Mitigation Act of 2000

The federal Disaster Mitigation Act (DMA) of 2000 (Public Law 106-390) provides the legal basis for FEMA mitigation planning requirements for state, local, and Indian tribal governments as a condition of mitigation grant assistance. The DMA amended the Robert T. Stafford Disaster Relief and Emergency Assistance Act by replacing previous mitigation planning provisions with new requirements that emphasize the need for planning entities to coordinate mitigation planning and implementation efforts. The law added incentives for increased coordination and integration of mitigation activities at the state level by establishing two levels of state plans. The DMA also established a new requirement for local mitigation plans and authorized up to 7 percent of Hazard Mitigation Grant Program funds to be available for development of state, local, and Indian tribal mitigation plans.

Participation in FEMA 404 Hazard Mitigation Grant Program (HMGP) may cover mitigation activities, including raising, removing, relocating, or replacing structures within flood hazard areas.

4.1.4 Endangered Species Act

The federal Endangered Species Act (ESA) was enacted in 1973 to conserve species facing depletion or extinction and the ecosystems that support them. The act sets forth a process for determining which species are threatened and endangered and requires the conservation of the critical habitat in which those species live. The ESA provides broad protection for species of fish, wildlife, and plants that are listed as threatened or endangered. Provisions are made for listing species, as well as for recovery plans and the designation of critical habitat for listed species. The ESA outlines procedures for federal agencies to follow when taking actions that may jeopardize listed species and contains exceptions and exemptions. It is the enabling legislation for the Convention on International Trade in Endangered Species of Wild Fauna and Flora. Criminal and civil penalties are provided for violations of the ESA and the Convention.

In some parts of the country, court rulings have found that floodplain management measures can conflict with the goals of the ESA. Those rulings have required FEMA and local governments to engage in a consultation process with federal wildlife agencies (Section 7 of the ESA) as they work to develop certain floodplain management programs, plans, and projects. Floodplain managers should be aware of any potential activities that could fall under the ESA.

4.1.5 The Clean Water Act

The federal Clean Water Act (CWA) employs regulatory and non-regulatory tools to reduce direct pollutant discharges into waterways, finance municipal wastewater treatment facilities, and manage polluted runoff. These tools are employed to achieve the broader goal of restoring and maintaining the chemical, physical, and biological integrity of the nation's surface waters so that they can support "the protection and propagation of fish, shellfish, and wildlife and recreation in and on the water."

Evolution of CWA programs over the last decade has included a shift from a program-by-program, source-by-source, pollutant-by-pollutant approach to more holistic watershed-based strategies. Under the watershed approach, equal emphasis is placed on protecting healthy waters and restoring impaired ones. A full array of issues are addressed, not just those subject to CWA regulatory authority. Involvement of stakeholder groups in the development and implementation of strategies for achieving and maintaining water quality and other environmental goals is a hallmark of this approach.

4.2 STATE

4.2.1 New York State Floodplain Management

There are two departments that have statutory authorities and programs that affect floodplain management at the local jurisdiction level in New York State: the NYSDEC and the Department of State's Division of Code Enforcement and Administration (DCEA).

4.2.2 New York State Department of Environmental Conservation (NYSDEC)

The NYSDEC is charged with conserving, improving, and protecting the state's natural resources and environment, and preventing, abating, and controlling water, land, and air pollution. Programs that have bearing on floodplain management are managed by the Bureau of Flood Protection and Dam Safety, which cooperates with federal, state, regional, and local partners to protect lives and property from floods, coastal erosion, and dam failures. These objectives are accomplished through floodplain management and both structural and nonstructural means.

The Dam Safety Section is responsible for "reviewing repairs and modifications to dams and assuring [sic] that dam owners operate and maintain dams in a safe condition through inspections, technical reviews, enforcement, and emergency planning." The Flood Control Projects Section is responsible for reducing flood risk to life and property through construction, operation, and maintenance of flood control facilities.

The Floodplain Management Section is responsible for reducing flood risk to life and property through management of activities, such as development in flood hazard areas, and for reviewing and developing revised flood maps. The Section serves as the NFIP State Coordinating Agency and, in this capacity, is the liaison between FEMA and New York communities that elect to participate in the NFIP. The Section provides a wide range of technical assistance.

4.2.3 New York City Department of Environmental Protection, Bureau of Water Supply, 2023-2033 Long-Term Land Acquisition Plan, 2023

The NYC DEP 2023–2033 Long-Term Land Acquisition Plan outlines a strategic framework to protect water quality in the City's upstate watershed by continuing voluntary land acquisitions in critical source water areas. This plan builds on decades of watershed protection efforts, emphasizing the importance of preserving undeveloped land near reservoirs and streams to prevent pollution and safeguard drinking water for over nine million New Yorkers. It identifies priority acquisition zones based on hydrologic sensitivity, development pressure, and ecological value, and integrates stakeholder input to ensure community alignment. The plan also supports stream management goals by maintaining natural stream functions, reducing erosion, and enhancing flood resilience across the Catskill and Delaware watersheds.

4.2.4 Department of State's Division of Code Enforcement and Administration (DCEA)

The DCEA *ensures the Health, Safety, and Resilience of the Built Environment for all New Yorkers*. The Division of Building Standards and Codes (BSC) administers the mandatory statewide Uniform Fire Prevention and Building Code (Uniform Code) and State Energy Conservation Construction Code (Energy Code). The Division

provides a variety of services related to the Uniform Code and Energy Code. It provides technical assistance, administers variances, delivers educational courses, oversees the enforcement practices of local governments and serves as secretariat to the State Fire Prevention and Building Code Council. The Albany Central Office and eleven regional offices throughout the state provide regional service to elected officials and local code enforcement personnel regarding general requirements for code enforcement. The Division program was created by Chapter 707 of the Laws of 1981. The New York Legislature enacted Article 18 of the Executive Law, directing the formulation of a Uniform Fire Prevention and Building Code (Uniform Code). The Uniform Code is designed to cover new construction, building rehabilitation, fire safety, and housing maintenance. (NYD DOS 2019 - https://www.dos.ny.gov/dcea/)

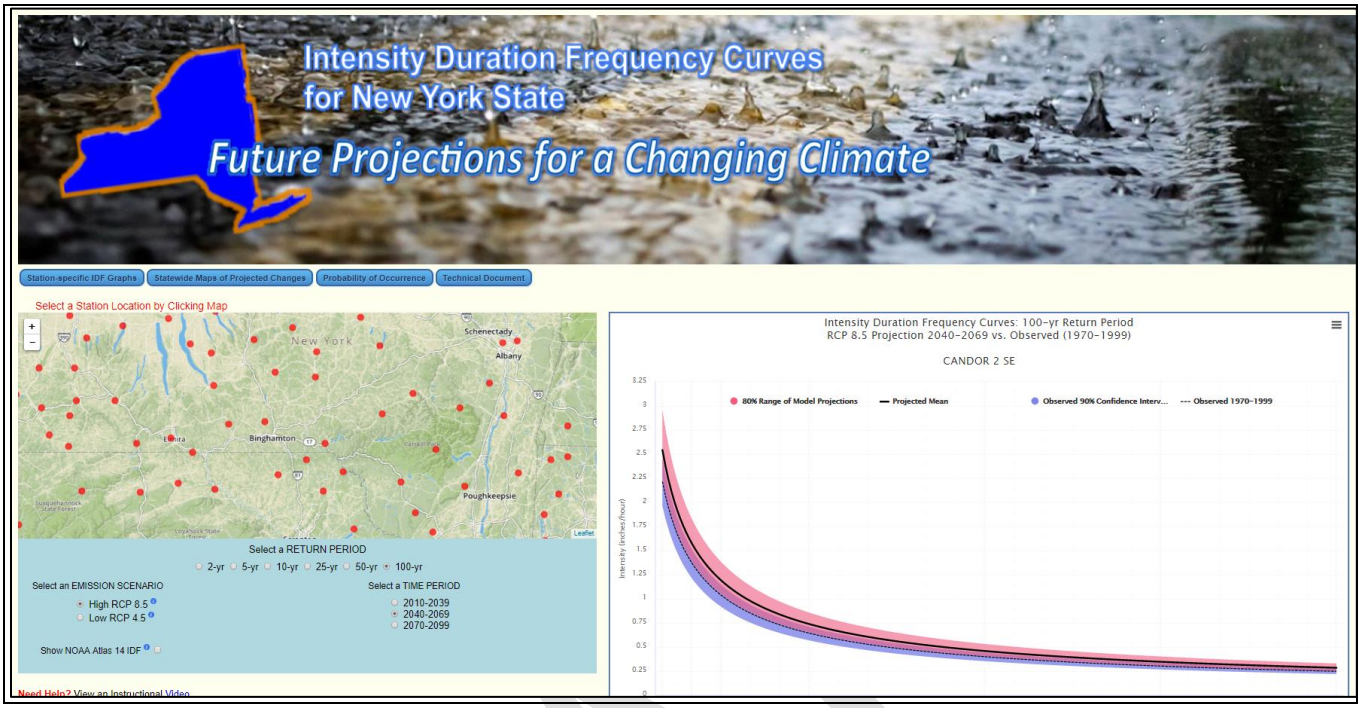
Catskill Park State Land Master Plan

The Catskill Park State Land Master Plan was created as a guiding document for the preservation of state-owned lands within Catskill Park. This plan is intended to help preserve the land and forested lands in Delaware, Greene, Sullivan, and Ulster County. This plan identifies management programs for the protection of natural resources from flooding events to ensure preservation of wildlife habitats. Dams and flood control structures are eligible to be constructed for ensuring operations of campgrounds and park facilities.

Northeast Regional Climate Center

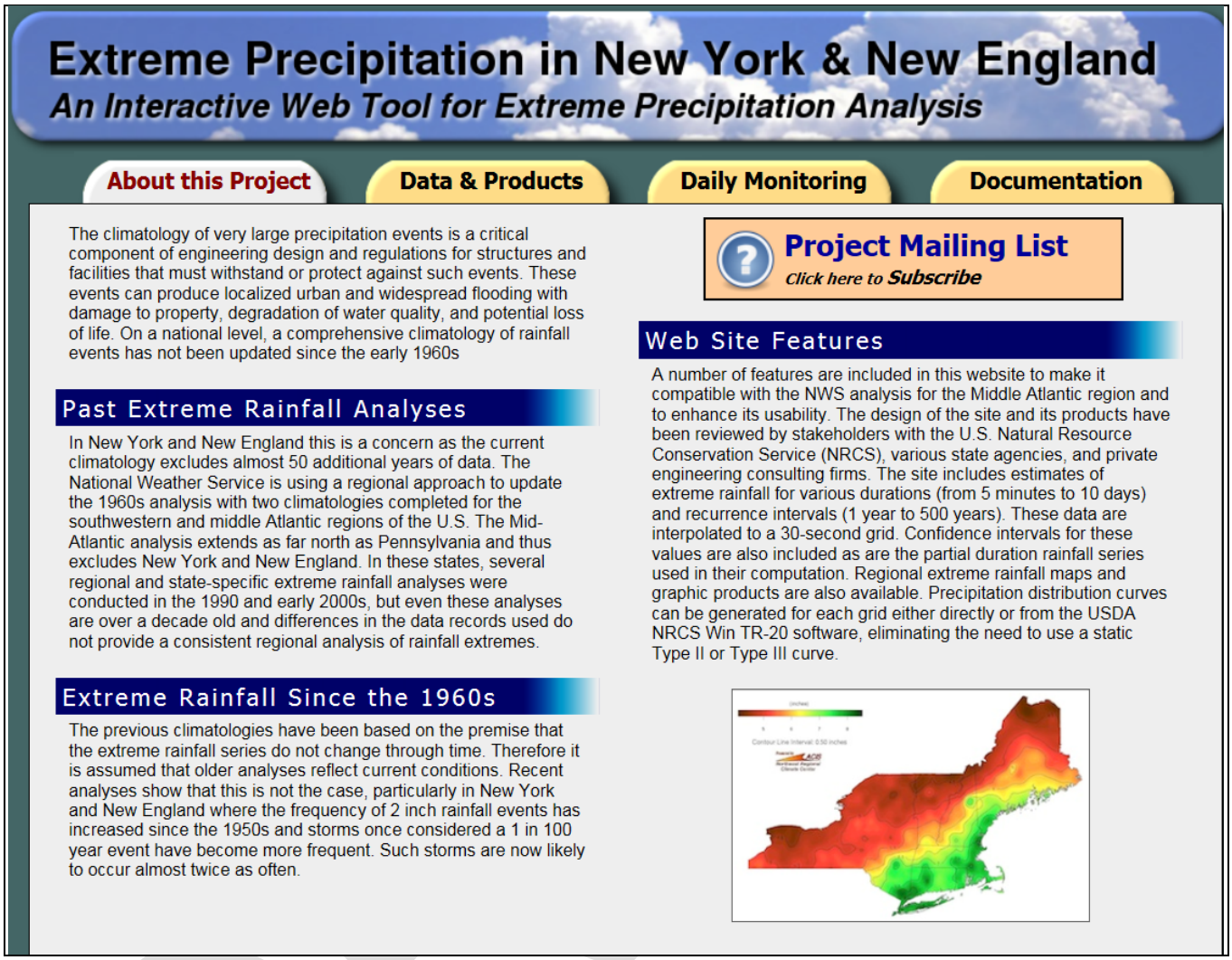
The Northeast Regional Climate Center (NRCC) has partnered with the New York State Energy Research and Development Authority (NYSERDA) to compare various methods of downscaling global climate model (GCM) output and create extreme precipitation projections for New York State. These projections will ultimately be incorporated into climate change adaptation planning. In 2009 alone, 175 total flooding events in New York State led to $32.82 million in property damage. The state is also still recovering from the $42 billion toll of Superstorm Sandy, among others. Climate change is resulting in an increase in the frequency of heavy rainfall events. To help New York State communities plan for the effects of climate change, new graphics are now available showing the increased likelihood of heavy precipitation events. These graphs, called Intensity Duration Frequency (IDF) curves, show anticipated increases of storm events from 2- to 100-year intervals, and are projected into the future as far as 2099. These products are designed for use by municipal officials, researchers, planners, highway departments, and other decision-makers who need to take storm events into account. These IDF curves display how precipitation events are being affected by New York State's rapidly changing climate (NRCC 2015). Figure 4-1 is a screenshot of the website.

Figure 4-1. Screenshot of the IDF Curves for New York State



NRCC also maintains the Extreme Precipitation in New York & New England website. It is an interactive tool for extreme precipitation analysis. The site includes estimates of extreme rainfall for various durations (from 5 minutes to 10 days) and recurrence intervals (1 year to 500 years). These data are interpolated to a 30-second grid. Confidence intervals for these values are also included, as are the partial duration rainfall series used in their computation. Regional extreme rainfall maps and graphic products are also available. Precipitation distribution curves can be generated for each grid either directly or from the USDA NRCS Win TR-20 software, eliminating the need to use a static Type II or Type III curve (NRCC 2018). This tool can be used by municipalities to assist them in the design and feasibility assessment of future projects and allow them to see the future intensity and frequency of rain events. Figure 4-2 is a screenshot of the website.

Figure 4-2. Screenshot of the Extreme Precipitation in New York & New England website



4.3 LOCAL

4.3.1 Beaver Kill Stream Management Plan, 2015

The Beaver Kill Stream Management Plan (SMP) is an assessment of the Beaver Kill's health, stability, and hydraulic and geomorphic conditions in the towns of Woodstock and Shandaken, Ulster County, New York. This assessment was conducted to identify hazards and prioritize restoration and flood hazard mitigation efforts based on threats to infrastructure, property, and water quality. The information gathered by this assessment has been compiled into an SMP with recommendations for improved stream stewardship practices and restoration ideas to enhance stream stability and water quality and mitigate flood and erosion hazards. (Ashokan Watershed Stream Management Program, 2015).

4.3.2 Phoenicia and Mt. Tremper Local Flood Analysis, 2015

This Local Flood Analysis (LFA) was created to evaluate flood mitigation within the Town of Shandaken in the hamlets of Phoenicia and Mt. Tremper along Esopus Creek, Stony Clove Creek, and the Beaver Kill. The LFA utilizes engineering and hydraulic analyses to illustrate the flood risk within these communities and allow for the identification of flood mitigation initiatives. (Milone & MacBroom, 2015)

4.3.3 Shandaken Allaben Local Flood Analysis, 2017

This LFA was created to evaluate flood mitigation within the hamlets of Shandaken and Allaben. This LFA examines sections of Esopus Creek, Bushnellsville Creek, Fox Hollow Creek, Peck Hollow Creek, and Broadstreet Hollow Creek. The LFA utilizes engineering and hydraulic analyses to illustrate the flood risk within these communities and allow for the identification of flood mitigation initiatives. The topography and development patterns of the town, effective flood mitigation initiatives were unable to be identified. (Milone & MacBroom, 2017)

4.3.4 Pine Hill Local Flood Analysis, 2023

The Pine Hill LFA outlines strategies to mitigate flood hazards, protect infrastructure, and enhance public safety within the Hamlet of Pine Hill, New York. This report provides detailed hydrologic and hydraulic analyses to identify areas vulnerable to flooding, evaluates the causes of flood risk, and recommends feasible mitigation projects. These include stream restoration, floodplain reconnection, and infrastructure improvements aimed at reducing flood impacts while supporting ecological health. The LFA serves as a planning tool to guide community decision-making and prioritize investments that align with both local needs and watershed-wide stream management goals. (Catskill Watershed Corporation & NYCDEP, 2023).

4.3.5 Phoenicia Additional Modeling Report, 2025

The Phoenicia Additional Modeling Report presents updated hydraulic analyses and conceptual flood mitigation strategies to address persistent flooding in the hamlet of Phoenicia, New York. Building on the 2016 Local Flood Analysis, this report explores enhancements to floodplains along Esopus and Stony Clove Creeks, and the replacement of undersized bridges, such as the Main Street and Bridge Street bridges. These strategies aim to improve stream conveyance, reduce backwater effects, and mitigate flood risks to critical infrastructure and downtown properties. The modeling results offer insights into how targeted interventions could increase Phoenicia's resilience to climate-driven flood events, while emphasizing the need for stakeholder collaboration, landowner participation, and further feasibility assessments before implementation.

4.3.6 Town of Shandaken's Stream Management Plans, 2003–2018

The Ashokan Watershed's suite of SMPs provides a comprehensive framework for addressing stream-related challenges across the Esopus Creek and its tributaries, including Broadstreet Hollow, Stony Clove Creek, Bushnellsville Creek, and Woodland Creek. These plans collectively assess physical stream conditions, water quality, erosion risks, and ecological health, while integrating community input and historical context. Esopus Creek Volumes I–III focus on geomorphic characterization, social and recreational use, and watershed geology. The Broadstreet Hollow SMP targets chronic turbidity from landslides and artesian mudboils, while the Stony Clove Creek SMP identifies it as a major sediment source due to steep terrain and glacial soils. Bushnellsville Creek's plan outlines erosion concerns along its 6.5-mile corridor, and Woodland Creek's SMP emphasizes sediment contributions and infrastructure vulnerability in a steep, dynamic watershed. Together, these plans guide

restoration priorities, stakeholder engagement, and long-term stream stewardship across the Town of Shandaken and surrounding communities.

4.3.7 Shandaken Town Complex Flood Mitigation Retrofit Feasibility Study, 2023

The Town Complex Flood Mitigation Retrofit Feasibility Study evaluates structural and nonstructural retrofit options to reduce flood vulnerability at key municipal facilities in Shandaken. The study includes risk assessments, cost-benefit analyses, and conceptual designs for retrofitting buildings and infrastructure to withstand future flood events. It emphasizes the importance of maintaining essential services during emergencies and aligns with the Town's broader flood mitigation goals. The study also highlights opportunities for funding and implementation through partnerships with state and federal agencies, reinforcing the Town's commitment to sustainable and resilient infrastructure planning.

4.3.8 Town of Shandaken Flood Relocation Feasibility Study, 2025

The Flood Relocation Feasibility Study evaluates strategies to mitigate flood risks to a vulnerable commercial and residential building located at 38 Main Street in Phoenicia, adjacent to Stony Clove Creek. Commissioned by the Town of Shandaken and funded by the Catskill Watershed Corporation, the study assesses environmental constraints, hydraulic modeling, utility access, and site development potential across multiple relocation alternatives. These include elevating or floodproofing the existing structure, relocating it within or outside the parcel, and enhancing the floodplain. The study provides mapping, cost analysis, and feasibility assessments to guide decision-making and identify funding sources for implementing flood mitigation solutions that improve safety and resilience.

4.3.9 Woodland Creek Stream Management Plan, 2018

The Woodland Creek SMP outlines strategies to address flood hazards, streambank erosion, water quality concerns, and riparian habitat impairments. This SMP contains information that can help identify where stream instabilities are threatening infrastructure or homes, what may be the cause of the instability, and where stream restoration efforts will be most effective for achieving the needs of a wide range of Woodland Creek stakeholders in the Town of Shandaken, New York. (Ashokan Watershed Stream Management Program, 2018)

4.3.10 Ulster County Multi-Jurisdictional Hazard Mitigation Plan Update, 2024

The Ulster County Multi-Jurisdictional Hazard Mitigation Plan was updated in May 2024. This plan was created as a part of an ongoing effort to ensure a coordinated approach to hazard mitigation for Ulster County, New York. This Hazard Mitigation Plan was developed with the input from County stakeholders to identify and reduce potential future losses related to natural hazard events. This plan also includes a jurisdictional annex for the Town of Shandaken, which identifies some of the mitigation actions that the Town has pursued and a capability assessment of the municipality. This annex also includes a status of five mitigation actions identified during the last planning cycle, of which two were completed.

4.3.11 Ulster County Comprehensive Emergency Management Plan, 2014

The Ulster County Comprehensive Emergency Management Plan was adopted by the Ulster County Legislature on June 17, 2014. The purpose of this plan is to *serve as a guiding document for risk reduction, emergency response and recovery from emergency situation* (Ulster County, 2014). Flooding was identified as one of the most severe hazards within Ulster County and one of the primary objectives within the risk reduction was to reduce flood exposure within the County by buyout programs, relocation, and stream management programs. Proactive mitigation can include *local land use controls and infrastructure investment policies that discourages inappropriate land use and development and floodprone areas. Use of LiDAR, couple with new hydraulic modeling, and other technologies, should be encouraged to develop more accurate flood plain delineation leading to greater accuracy in predicting expected flood levels, associated damages and prioritization in the use of funding.*

4.3.12 Ulster County – Emergency Evacuation / Detour Route Annex, November 2005

The Ulster County Comprehensive Emergency Management Plan has an annex that identifies and establishes the procedure(s) necessary to facilitate a county evacuation in response to a natural hazard or disaster. This annex was created in November 2005. Four hazards were identified as being likely to cause an evacuation: hazardous materials accident, flood, fire, or transportation accident.

4.3.13 Ulster County Transportation Council Rethinking Transportation: Plan 2040 - Year 2040 Long Range Transportation Plan, September 29, 2015

The Ulster County Year 2040 Long Range Transportation Plan is created for the period of October 1, 2015 to September 30, 2020. This transportation plan is intended to serve as a comprehensive source of information regarding transportation development for Ulster County, New York through the year 2040. The Town of Shandaken is referenced in terms of major development that is proposed or pending, which was the Belleayre Ski Resort.

4.3.14 Ulster County Subdivision Requirements. Ulster County Department of Public Works (DPW), November 2008

The Ulster County DPW Subdivision requirements establish specifications for *travelways that serve three or more single-family dwellings,* Specific design requirements relating to drainage and culverts are outlined, which would ensure that subdivision development would have adequate capacity to handle precipitation or groundwater flow.

4.3.15 Town of Shandaken Floodplain Management Plan, 2018

The Town of Shandaken Floodplain Management Plan outlines strategies to reduce flood hazards, protect water quality, and enhance community resilience in the hamlets of Shandaken and Allaben. Developed through the Local Flood Analysis process, the plan integrates watershed data, hydraulic modeling, and public input to identify floodprone areas and evaluate mitigation alternatives. These include infrastructure upgrades, stream restoration, and land use adjustments aimed at minimizing flood impacts while preserving ecological function. The plan serves as a decision-making tool to guide future investments and policy actions that support both public safety and environmental stewardship in the Town of Shandaken, New York.

4.3.16 Town of Shandaken Comprehensive Plan, July 2005

The Town of Shandaken Comprehensive Plan was approved by the Shandaken Town Board on July 11, 2005. This Comprehensive Plan serves as a guiding document to facilitate economic development and to encourage the development of the Town into a more prosperous municipality. The plan also discusses land usage and the availability of developable land in relation to floodplains. Land use and development is also discussed in the Comprehensive Plan due to the relatively steep topography in the area, which means that exposure to flooding could result in significant exposure and losses due to flooding. Flood mitigation was identified as an immediate priority within the Comprehensive Plan.

4.3.17 Town of Shandaken Fire Prevention and Building Code Administration – Chapter 74, Adopted April 7, 2008

Chapter 74 of the Shandaken Town Code *provides for the administration and enforcement of the New York State Uniform Prevention and Building Code as well as the State Energy Conservation Construction Code.* This code also pertains to certificates of occupancy, unsafe buildings, and construction permits. Chapter 74 requires that a flood hazard certification be submitted to the Code Enforcement Officer before a Certificate of Occupancy be issued.

4.3.18 Town of Shandaken Flood Damage Prevention Ordinance – Chapter 77, Adopted October 3, 2016

The Town of Shandaken Flood Damage Prevention Ordinance was created to minimize public and private losses due to flood conditions within the Town of Shandaken. The application of this flood damage prevention ordinance can help to regulate development and ensure that structures within the floodplain are able to withstand flooding or be protected from flooding as well as ensure that future development within the floodplain does not occur. The ordinance also contains some regulations exceeding federal minimums, most notably the requirement of 2 feet of freeboard.

4.3.19 Subdivision Ordinance – Chapter 105, Adopted December 11, 1971

The Subdivision Ordinance states that the subdivision of land shall take place with consideration for fire, flood, and other hazards as well as ensure that adequate drainage is provided. The Subdivision Ordinance can be used in conjunction with the zoning ordinance and flood legislation to strengthen the Town's flood management program.

4.3.20 Zoning Ordinance – Chapter 116, Adopted December 9, 1987

The Zoning Law of the Town of Shandaken regulates the location, construction, alteration, and use of buildings and structures and the development and use of land within the Town of Shandaken and, for said purposes, divides the Town into zoning districts (Town of Shandaken, 1987). The zoning ordinance was passed to regulate safe and sustainable development in the Town. The Zoning Law takes other hazards besides flooding into consideration to maintain and promote public health and welfare. Regulation of development location and type is a critical aspect of ensuring community growth and resilience. This zoning regulation can be used in conjunction with other legislation to enforce safe development patterns out of the floodplain.

Article VIII of the Town of Shandaken Zoning Ordinance requires non-residential property be approved *prior to the issuance of Building Permits and Certificates of Occupancy.* A detailed plan for proposed development must be submitted to the Planning Board and must include an area map, land holdings information, and an existing conditions map. The existing conditions map provides detailed landscape information and natural features such as *streams, wetlands, rock outcroppings, soil conditions, and floodprone areas.* This site plan review process can help the Town of Shandaken to have a greater degree of control over proposed development and to integrate floodplain management practices into future development.

4.4 CAPABILITY ASSESSMENT

A capability assessment is an inventory of a community's missions, programs, and policies, and an analysis of its capacity to carry them out. This assessment is an integral part of the planning process. It identifies, reviews, and analyzes local and state programs, policies, regulations, funding, and practices currently in place that may either facilitate or hinder mitigation.

A capability assessment was prepared by the Town. By completing this assessment, the Town learned how or whether they would be able to implement certain mitigation actions by determining the following:

- Types of mitigation actions that may be prohibited by law
- Limitations that may exist on undertaking actions
- The range of local and/or state administrative, programmatic, regulatory, financial, and technical resources available to assist in implementing their mitigation actions
- Action is currently outside the scope of capabilities (e.g., funding)

Table 4-1 presents legal and regulatory capabilities. Table 4-2 presents the administrative and technical capabilities. Table 4-3 presents fiscal capabilities, and Table 4-4 presents the community classifications for the Town. This plan was prepared with input and under the supervision of the Town of Shandaken NFIP Floodplain Administrator, who participated as a member of SAFARI and had access to all documents for review and comment throughout the planning process.

Table 4-1. Legal and Regulatory Capabilities

Regulatory Tools (Codes, Ordinances, Plans)	Do you have this capability?	Local Authority (Y or N)	Prohibitions (State or Federal) (Y or N)	Higher Jurisdictional Authority (Y or N)	State Mandated (Y or N)	Code Citation (Section, Paragraph, Page Number, date of adoption)
1) Building Code	Y	N	N	N	N	New York State Code (IBC)
2) Zoning Ordinance	Y	N	N	N	N	Town, LOCAL LAW #2 December 1987, Chapter 116
3) Subdivision Ordinance	Y	Y	N	Y	Y	12/71 Subdivision Ordinance Section 105 Town Code
4) NFIP Protection Ordinance	Y	Y	Y	N	Y	10/3/2016 Local Law #1, Chapter 77
5) Growth Management	N	N	N	N	N	
6) Floodplain Management / Basin Plan	Y	Y	N	N	N	This plan is the Floodplain Management Plan of record for Shandaken.

Regulatory Tools (Codes, Ordinances, Plans)	Do you have this capability?	Local Authority (Y or N)	Prohibitions (State or Federal) (Y or N)	Higher Jurisdictional Authority (Y or N)	State Mandated (Y or N)	Code Citation (Section, Paragraph, Page Number, date of adoption)
7) Stormwater Management Plan/Ordinance	Y	Y	Y	Y	Y	Under NYC DEP Watershed Rules and Regulations, Stormwater Protection Plans are required for all building in the town
8) Comprehensive Plan / Master Plan	Y	Y	N	Y	Y	July 2005
9) Capital Improvements Plan	N	N	N	N	N	
10) Site Plan Review Requirements	Y	Y	N	N	N	Chapter 116 Article 8, Local Law #2 of 1997
11) Open Space Plan	Y	N	Y	N	N	Catskill Park State Land Master Plan (2008)
12) Stream Corridor Management or Protection Plan	Y	N	N	N	N	Esopus Creek Corridor Management and Protection, adopted by the Town in 2008.
13) Economic Development Plan	N	N	Y	Y	N	
14) Emergency Response Plan	Y	Y	Y	N	Y	Town has a flood emergency response plan.
15) Post Disaster Recovery Plan	N	N	N	N	N	
16) Post Disaster Recovery Ordinance eq.	N	N	N	N	N	
17) Real Estate Disclosure	Y	N	N	N	N	NYS real estate law
18) Highway Management Plan	N	Y	N	N	N	
19) COOP/COG Plan	N	Y	N	N	N	Continuity of Operations, Continuity of Government
20) Other [Special Purpose Ordinances (i.e., critical or sensitive areas)]	Y	Y	Y	Y	N	NYC Watershed Regulations; NYS DEC, Town Zoning 116-29 and 41, Standards Within a Flood Fringe Overlay District (as mapped by FEMA). 1993

Table 4-2. Administrative and Technical Capabilities

Staff/ Personnel Resources	Available (Y or N)	Department/ Agency/Position
1) Planner(s) or Engineer(s) with knowledge of land development and land management practices	Y	Shandaken Planning Board
2) Engineer(s) or Professional(s) trained in construction practices related to buildings and/or infrastructure	Y	Knowledgeable Town staff: Supervisor, Building Inspector and Highway Superintendent
3) Planners or engineers with an understanding of natural hazards	Y	Town and County Planning Boards, AWSMP
4) NFIP Floodplain Administrator *	Y	Town Supervisor

Staff/ Personnel Resources	Available (Y or N)	Department/ Agency/Position
5) Surveyor(s) hired independently as needed	Y	Hired independently as needed
6) Personnel skilled or trained in "GIS" applications	Y	AWSMP, Ulster County Department of Planning
7) Scientist(s) familiar with natural hazards in the Town of Shandaken	Y	AWSMP, NYSDEC
8) Emergency Manager	Y	Ulster County Emergency Coordinator; Town Civil Defense Coordinator, Fire Chiefs, Police, EMS; Incident Commander
9) Grant writer(s)	Y	SHARP, RCAP Solutions, AWSMP, MARK Project, Town of Shandaken
10) Staff with expertise or training in FEMA benefit/cost analysis	N	NYSOEM provides support

Table 4-3. Fiscal Capabilities

Financial Resources	Accessible or Eligible to Use (Yes/No/Don't Know)
1) Community Development Block Grants (CDBG)	Yes
2) Capital Improvements Project Funding HMGP	Yes, DWSRF for Pine Hill Water District
3) Authority to Levy Taxes for specific purposes	Yes: Fire Districts, Water Districts, Lighting, Library
4) User fees for water, sewer, gas, or electric service	Yes, water
5) Impact Fees for homebuyers or developers of new development/homes	No
6) Incur debt through general obligation bonds	Yes
7) Incur debt through special tax bonds	Yes
8) Incur debt through private activity bonds	No
9) Withhold public expenditures in hazard-prone areas	Yes
10) Government mitigation grant programs (e.g., NYSDEC, FEMA)	Yes
11) Other-Catskill Watershed Corporation (CWC) NRCS Emergency Watershed Protection (EWP), Ashokan Watershed Stream Management Program (AWSMP) grants	Yes

Table 4-4. Community Classifications

Program	Classification	Date Classified
Community Rating System (CRS)	8	2021
Building Code Effectiveness Grading Schedule (BCEGS)	NP	NA
Storm Ready	NP	NA
Firewise	NP	NA
Public Protection (ISO) Classification	NP	NA

The classifications listed above relate to the community's effectiveness in providing services that may impact its vulnerability to the natural hazards identified. These classifications can be viewed as a gauge of the community's capabilities in all phases of emergency management (preparedness, response, recovery, and mitigation) and are used as an underwriting parameter for determining the costs of various forms of insurance. The CRS class

applies to flood insurance, while the BCEGS and Public Protection classifications apply to standard property insurance. CRS classifications range on a scale of 1 to 10, with Class 1 being the best possible classification, and Class 10 representing no classification benefit. Firewise classifications include a higher classification when the subject property is located beyond 1,000 feet of a creditable fire hydrant and is within 5 road miles of a recognized fire station.

Criteria for classification credits are outlined in the following documents:

- Community Rating System Coordinators Manual
- Building Code Effectiveness Grading Schedule
- ISO Mitigation online ISO's Public Protection website at http://www.isomitigation.com/ppc/0000/ppc0001.html
- National Weather Service Storm Ready website at http://www.weather.gov/stormready/howto.htm
- National Firewise Communities website at http://firewise.org/

5. POTENTIAL MITIGATION FUNDING SOURCES

The following programs are examples of potential local, state, and federal grant opportunities that the Town and/or a property owner may explore and support flood risk reduction. They fund qualified mitigation projects such as:

- Elevation and/or relocation of machinery and equipment
- Structural elevation
- Acquisition

In New York State, there are several state and federal mitigation grant opportunities available for homeowners to help with flood and other hazard mitigation for houses. Some key programs include:

- **New York State Resilient Retrofits Program**: This program offers funding to eligible homeowners in floodprone areas to make proactive flood mitigation improvements to their homes. For example, elevating the home, installing flood barriers, or other measures to reduce flood risk.
- **Hazard Mitigation Assistance Programs**: Through the Division of Homeland Security and Emergency Services (DHSES), there are grant opportunities like Flood Mitigation Assistance that may help fund mitigation projects to reduce or eliminate long-term risk of flood damage to homes.
- **New York State Hazard Mitigation Revolving Loan Fund**: Provides low-interest loans to homeowners for flood mitigation projects.
- **Inflation Reduction Act Incentives**: Administered by NYSERDA, some programs offer funding and rebates for home upgrades that improve resilience and energy efficiency, which can be combined with mitigation efforts.
- **Federal Programs via FEMA**: Homeowners can also apply for federal HMGP funding after federally declared disasters, which can be used for flood mitigation projects.

For the most accurate and up-to-date information, homeowners should check with New York State agencies such as DHSES, NYSERDA, and NYSDEC or local government offices managing floodplain and hazard mitigation programs.

NFIP flood insurance policies include Increased Cost of Compliance (ICC) coverage is an additional component of a standard flood insurance policy that helps policyholders cover the costs required to bring a substantially or repetitively flood-damaged building into compliance with current floodplain management regulations. Specifically, ICC coverage includes financial assistance for:

- Elevating the building above the base flood elevation;
- Floodproofing the building (applicable to non-residential structures);
- Relocating the building to a less floodprone area; and
- Demolishing or razing the building if it cannot be safely elevated or relocated.

ICC coverage supports the goal to reduce future flood damage and improve community resilience by ensuring that repaired or rebuilt structures meet current floodplain management requirements. ICC coverage provides up to $30,000 in additional funds beyond the standard building coverage limits in an NFIP policy.

Local Flood Hazard Mitigation Implementation Program administered by the Catskill Watershed Corporation (CWC), provides funding for projects that reduce flood risk and improve water quality in the West-of-Hudson

watershed. Both municipalities and individual property owners may apply directly to the CWC for support. Citizens can learn more about the program and qualifiers by visiting their website at https://cwconline.org/.

Projects must address imminent threats to public safety or enhance community-scale flood resilience. Eligible projects identified through LFAs or the New York Rising planning process may include:

- Alterations to public infrastructure to reduce flood damage.
- Elevation or floodproofing of private structures.
- Relocation or securing of fuel oil/propane tanks to eliminate pollution risks.
- Stream-related construction (excluding floodwalls, berms, levees, dredging, or routine maintenance).
    - Relocation assistance for residences or businesses within the same town or village.
    - Additional assistance is available for:
    - Relocation of anchor businesses (e.g., gas stations, grocery stores, medical offices) in floodplain hamlets, even if not recommended in an LFA.
    - Relocation of critical community facilities (e.g., firehouses, schools, water/wastewater facilities) that have sustained substantial flood damage.
    - Relocation of homes or businesses within the same town when New York City-Funded Flood Buyout Program (NYCFFBO) covers the original property purchase.
    - Stream debris removal following a major flood event, regardless of LFA recommendation.

6. MITIGATED REPETITIVE LOSS PROPERTIES

6.1 REPETITIVE LOSS LIST CORRECTION

CRS-participating communities must review their lists of repetitive loss properties for accuracy, for correct addresses, to determine whether the properties are actually in the community's corporate limits, and to determine whether the insured buildings have been removed, retrofitted, or otherwise protected from the cause of the repetitive flooding. The result of this review is recorded on a Transmittal Sheet NFIP Repetitive Loss (RL) Update Worksheet (see Figure 6-1). A community with repetitive losses must sign the Repetitive Loss List Community Certification, CC-RL, certifying that each address has been checked. If there are updates, the submittal must include corrected Transmittal Sheet NFIP Repetitive Loss (RL) Update Worksheet with any required supporting documentation. The community must note the following situations in which the form should be updated:

- The property is not located in the community's jurisdiction. The property may be outside the community's corporate limits, it may be in another city, or it may have been annexed by another community. If it can be determined in which community the property belongs, the property will be reassigned to the correct community. If a property is not in the community, it will not be reassigned unless the community in which the property does belong can be definitely identified.
- There was an error in the repetitive loss database, such as a duplicate listing or an incorrect address.
- The property has subsequently been protected from the types of events that caused the losses. Buildings that have been acquired, relocated, retrofitted, or otherwise protected from the types of frequent floods that caused the past damage are not counted in determining the community's CRS requirements.
- The property is protected from damage by the base flood shown on the current FIRM. For example, the community may demonstrate that the building is elevated or flood-proofed above the base flood elevation but was flooded by a higher level. If the property is outside the SFHA, the community may show that all of the repetitive losses were caused by events with recurrence intervals of over 100 years (e.g., two 200-year storms).

6.2 MITIGATED REPETITIVE LOSS PROPERTIES

The Town of Shandaken is using the 2024 FEMA repetitive loss list for the 5-year update assessment. According to this data, the Town of Shandaken has 30 repetitive loss properties; however, nine of those are recognized as "mitigated" or "cannot be verified/located." The mitigated properties are shown in Table 6-1 and have been addressed by the submittal of Transmittal Sheet NFIP Repetitive Loss (RL) Update Worksheet forms to update the current status of properties in the Town. These properties remain in the Town's designated repetitive loss area; the SFHA has been identified as the Town's repetitive loss area and will continue to receive an annual outreach. August 2025, complete documentation for 9 repetitive loss updates was submitted to FEMA-nfipcustomerservicecenter@fema.dhs.gov for review. The submittals were acknowledged by NFIP Customer Services. For 2025 CRS purposes, the 2025 repetitive loss inventory has been updated to reflect 18 addresses for the assessment. These 18 repetitive loss addresses remain within the existing 11 sub-repetitive loss areas.

2024 RL Inventory	2025 RL Inventory Updates
30	-9
2025 Total RL Inventory for the RLAA 5-year update	**18**

Figure 6-1. Example AW-501

TRANSMITTAL SHEET
NFIP REPETITIVE LOSS (RL) UPDATE WORKSHEET

Please provide the following contact information should your community need to be contacted for more information to approve your updates.

Name: _____

Address: _____

_____

Phone: _____ FAX: _____

E-Mail: _____

Please indicate the number of RL Update Worksheets submitted for this update. _____

Signature: _____

Send updated RL worksheets and this transmittal sheet via e-mail to:
NFIPUnderwritingMailbox@fema.dhs.gov

FEMA

NATIONAL FLOOD INSURANCE PROGRAM

Table 6-1. 2018 and 2025 Mitigated Repetitive Loss Properties

2018 Reported Mitigated Repetitive Loss Properties Submitted		
Repetitive Loss Number	**Date Corrected**	**Mitigation Type**
74010	11/22/2016	FEMA Buyout
103629	4/13/2017	FEMA Buyout
211888	4/13/2017	FEMA Buyout
165236	9/28/2017	FEMA Buyout
196493	8/31/2016	FEMA Buyout
196453	10/4/2016	FEMA Buyout
208160	2017	Substantial improvement made; Built to code

2018 Reported Mitigated Repetitive Loss Properties Submitted		
Repetitive Loss Number	**Date Corrected**	**Mitigation Type**
196089	9/25/2017	Structure removed; New construction on property will be built to code
2025 Reported Mitigated Repetitive Loss Properties Submitted		
Repetitive Loss Number	**Date Corrected**	**Mitigation Type**
211888	5/21/2024	FEMA Buyout
196493	5/21/2024	FEMA Buyout
196453	5/21/2024	FEMA Buyout
196089	5/21/2024	Structure demolished by landowner
54561	5/21/2024	Structure demolished by landowner
165236	5/21/2024	FEMA Buyout
103629	5/21/2024	FEMA Buyout
92830	05/21/2024	No structure on property
74010	05/21/2024	FEMA Buyout

7. MITIGATION ALTERNATIVES CONSIDERED

Although this report presents separate analyses for each identified sub-repetitive loss areas in the Town of Shandaken, the list of potential measures to address repetitive flooding problems was the same for each area. This chapter summarizes the alternatives that were identified for consideration. These alternatives can be implemented by the Town, the homeowner, or other entities. The selection of suitable alternatives for each at-risk property in the repetitive loss areas is described in the chapters presenting individual sub-repetitive loss area analyses.

Many types of flood hazard mitigation exist, and there is not one mitigation measure that fits every case or even most cases. Successful mitigation often requires multiple strategies. The CRS Coordinator's Manual (FEMA FIA-15, 2025) breaks the primary types of mitigation down as follows:

- **Preventive** activities keep flood problems from getting worse. The use and development of floodprone areas is limited through planning, land acquisition, or regulation. They are usually administered by building, zoning, planning, and/or code enforcement offices.
- **Property protection** activities are usually undertaken by property owners on a building-by-building or parcel basis.
- **Natural resource protection** activities preserve or restore natural areas or the natural functions of floodplain and watershed areas. They are implemented by a variety of agencies, primarily parks, recreation, or conservation agencies or organizations.
- **Emergency services** are measures taken during an emergency to minimize its impact. These measures are usually the responsibility of city or county emergency management staff and the owners or operators of major or critical facilities.
- **Structural projects** keep floodwaters away from an area with a levee, reservoir, or other flood control measure. They are usually designed by engineers and managed or maintained by public works staff.
- **Public information** activities advise property owners, potential property owners, and visitors about hazards and ways to protect people and property from them, as well as the natural and beneficial functions of local floodplains. They are usually implemented by a public information office.

7.1 FLOOD INSURANCE COVERAGE

Flood insurance coverage is a first responder to flood source damage. Coverage is considered a priority action encouraged by the Town to its citizens. As an NFIP community, NFIP flood insurance is available to all within the town. Properties do not need to be within the mapped floodplain to qualify for a flood insurance policy. The Town receives a 10 percent discount applied to NFIP policyholders, and policies are available to property owners and renters. Flood insurance coverage is important because:

1. **Protection Against Financial Loss:** Flooding can cause extensive damage to homes and property. Standard homeowners' insurance policies typically do not cover flood damage, so flood insurance provides critical financial protection.
2. **High Risk of Flooding:** Many areas, including those not traditionally considered flood zones, can experience flooding due to heavy rain, storms, hurricanes, or rising water levels. Flood insurance helps mitigate the risk.
3. **Cost of Repairs:** Flood damage repairs can be very expensive, including structural repairs, replacing furniture, appliances, and personal belongings. Flood insurance helps cover these costs.

4. **Mortgage Requirement:** Lenders often require flood insurance for properties located in designated flood zones as a condition of the mortgage.
5. **Peace of Mind:** Having flood insurance provides homeowners and business owners with peace of mind knowing they are financially protected if a flood occurs.
6. **Recovery Assistance:** Flood insurance can speed up recovery by providing funds to repair and rebuild quickly after a flood event.

For the National Flood Insurance Program policy claims, a flood is defined as:

A general and temporary condition of partial or complete inundation of two or more acres of normally dry land area or of two or more properties (at least one of which is the policyholder's property) from:

- Overflow of inland or tidal waters;
- Unusual and rapid accumulation or runoff of surface waters from any source;
- Mudflow (defined as a river of liquid and flowing mud on the surfaces of normally dry land areas); or
- Collapse or subsidence of land along the shore of a lake or similar body of water as a result of erosion or undermining caused by waves or currents of water exceeding anticipated cyclical levels.

This definition is crucial because it determines whether a loss qualifies as a flood event under the NFIP policy for claims purposes. Flood insurance is available from private insurance providers and the NFIP.

7.2 PREVENTIVE

The Town of Shandaken regulates residential and commercial development through its building code, planning and zoning requirements, stormwater management regulations, and floodplain management ordinances. Any project located in a floodplain, regardless of its size, requires a permit from the Town of Shandaken, unless the project can be characterized as routine maintenance.

Additionally, there are also local programs that could assist property owners, such as:

- **New York City Funded Flood Buyout Program (NYCFFBO)** which offers alternative mitigation pathways for property owners. This voluntary initiative is designed to support individuals who were either ineligible for or opted out of the FEMA flood buyout program. Unlike emergency response programs, NYCFFBO operates between flood events, focusing on long-term resilience and strategic land use planning.

  Eligible property categories include:

  - Hydraulic Study Properties:
    - Properties identified in community LFAs.
    - Anchor businesses, critical community facilities, and LFA-identified properties applying to the Catskill Watershed Corporation (CWC) for relocation assistance.
  - Special Case Properties:
    - Properties needed for stream restoration or enhancement projects.
    - Properties located in erosion hazard zones.
    - Properties located in inundation hazard zones.

7.3 PROPERTY PROTECTION

These measures are generally performed by property owners or their agents. FEMA has published numerous manuals that help a property owner determine which property protection measures are appropriate for particular situations:

- FEMA 259, Engineering Principles and Practices of Retrofitting Floodprone Residential Structures
- FEMA 312, Homeowner's Guide to Retrofitting: Six Ways to Protect Your House from Flooding
- FEMA 551, Selecting Appropriate Mitigation Measures for Floodprone Structures
- FEMA 348, Protecting Building Utilities from Flood Damage
- FEMA 511, Reducing Damage from Localized Flooding
- FEMA 102, Floodproofing Non-Residential Structures
- FEMA 84, Answers to Questions about the NFIP
- FEMA 54, Elevated Residential Structures Book
- FEMA 268, Protecting Floodplain Resources: A Guidebook for Communities
- FEMA 347, Above the Flood: Elevating Your Floodprone House
- FEMA 85, Protecting Manufactured Homes from Floods and Other Hazards

The manuals listed above are available for review at FEMA's website. For a complete guide to retrofitting homes for flood protection, see FEMA P-312, *Homeowner's Guide to Retrofitting 3rd Edition* (2014). The primary methods of property protection in the Town of Shandaken are:

- Demolition/relocation.
- Elevation (structure or damage prone components such as furnace or AC unit)
- Dry flood-proof (so water cannot get in).
- Wet flood-proof portions of the building (so water will not cause damage).
- Direct drainage away from the building.
- Drainage maintenance.
- Sewer Improvements.

In addition to these resources provided by FEMA, the Hamlet of Pine Hill Local Flood Analysis (2012) recommended potential measures for property protection, such as:

- Relocate valuable belongings above the 100-year flood elevation to reduce the amount of damage caused during a flood event.
- Relocate or elevate water heaters, heating systems, washers, and dryers to a higher floor or to at least 12 inches above the BFE.
- Anchor fuel tanks to the wall or floor with noncorrosive metal strapping and lag bolts.
- Install a backflow valve to prevent sewer or septic backup into the home.
- Install a floating floor drain plug at the lowest point of the lowest finished floor.
- Elevate the electrical box or relocate it to a higher floor and elevate electric outlets to at least 12 inches above the high-water mark.

- **Local Flood Hazard Mitigation Implementation Program** administered by the Catskill Watershed Corporation (CWC), provides funding for projects that reduce flood risk and improve water quality in the West-of-Hudson watershed. Both municipalities and individual property owners may apply directly to the CWC for support.
  - Projects must address imminent threats to public safety or enhance community-scale flood resilience. Eligible projects identified through LFAs or the New York Rising planning process may include:
    - Alterations to public infrastructure to reduce flood damage.
    - Elevation or floodproofing of private structures.
    - Relocation or securing of fuel oil/propane tanks to eliminate pollution risks.
    - Stream-related construction (excluding floodwalls, berms, levees, dredging, or routine maintenance).
    - Relocation assistance for residences or businesses within the same town or village.
  - Additional assistance is available for:
    - Relocation of anchor businesses (e.g., gas stations, grocery stores, medical offices) in floodplain hamlets, even if not recommended in an LFA.
    - Relocation of critical community facilities (e.g., firehouses, schools, water/wastewater facilities) that have sustained substantial flood damage.
    - Relocation of homes or businesses within the same town when NYCFFBO covers the original property purchase.
    - Stream debris removal following a major flood event, regardless of LFA recommendation.

7.4 ACQUISITION

One of the most effective approaches to preventing further flood damage to a building is acquisition and relocation or clearing of the structure. This approach allows the property to be repurposed as open space or a recreational area.

Mitigation Options for Property Owners:

- Voluntary Participation: Property owners have the right to choose acquisition as a mitigation strategy.
- Sale of Property:
  - To a government agency.
  - To an organization dedicated to preserving and managing local open space.
- Relocation of Structure:
  - To another property.
  - To a different area on the same property, if that area lies outside the flood hazard zone.
- Federal Funding: Property owners may be eligible for federal funding to support these mitigation efforts.

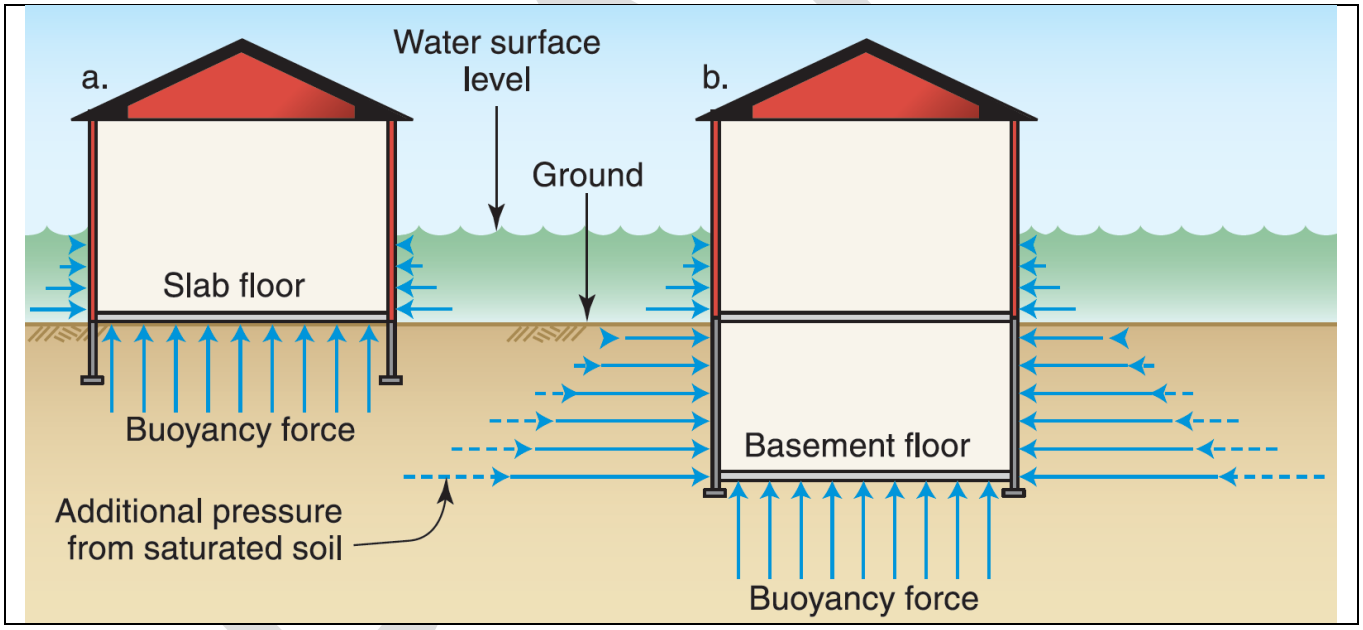
7.5 HOME ELEVATION

Sometimes dry or wet floodproofing techniques cannot provide effective flood mitigation, and greater measures must be taken. For example, if the floodwaters are too high for dry floodproofing and the inhabited area is too low for wet floodproofing, it may be necessary to raise the structure. Whenever the floor of a home is below the 100-year flood elevation, physically elevating the structure is often recommended, as it is one of the most effective means to prevent flood damage. Financial assistance may be available for floodproofing. The Town of Shandaken requires all substantially improved residential buildings to have their lowest floor elevated 2 feet above the 100-year elevation.

7.6 DRY FLOODPROOFING

Dry floodproofing consists of completely sealing around the exterior of the building so that water cannot enter the building (see Figure 7-1). Dry floodproofing is not a good option for areas where floodwater is deep or flows quickly. The hydrostatic pressure and/or hydrodynamic force can structurally damage the building by causing the walls to collapse or causing the entire structure to float. However, in areas that have minimal velocity and low depth, dry floodproofing can be a good option.

Figure 7-1. Dry Floodproofing Example



Source: FEMA P-312, June 30, 2014

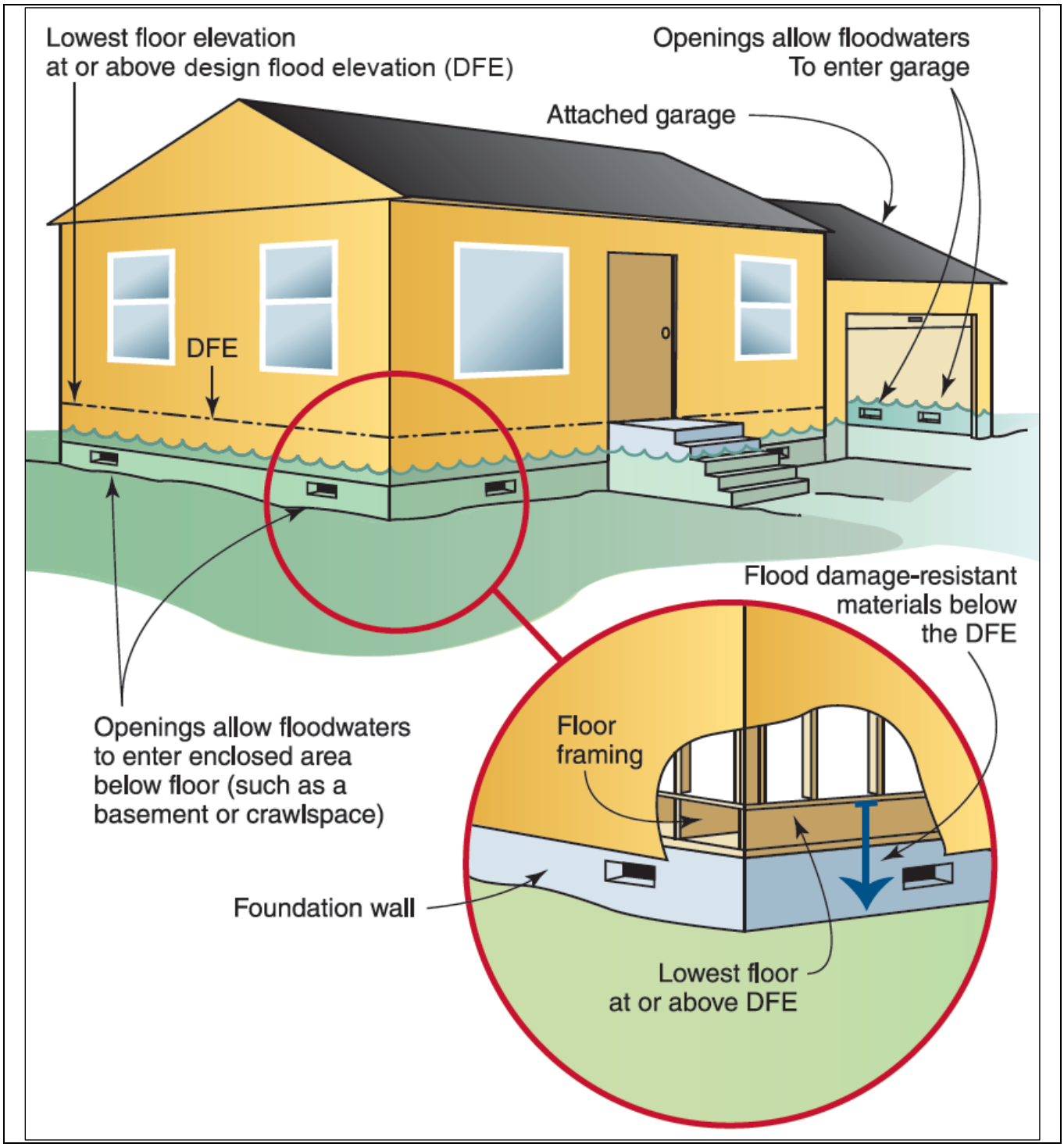
Many flood hazards can be mitigated with various forms of dry floodproofing. Properties that do not have adequate protection of their low opening (window or basement door) can effectively raise the low opening height with a window well or a flood gate. The ultimate height of the low opening depends on several factors, such as the level of flood protection desired, appearance, and cost. The flood protection elevation could be set 1 foot higher than the existing low opening elevation, or it could be set to match the elevation of the lowest opening into a home that cannot be raised. This might be the elevation of the threshold of a door, for example.

The NFIP only allows dry floodproofing for residential retrofits that are not classified as a substantial improvement. A substantial improvement is any reconstruction, rehabilitation, addition, or other improvement of a structure, the cost of which equals or exceeds 50 percent of the market value of the structure before the “start of construction” of the improvement.

7.7 WET FLOODPROOFING

Wet floodproofing consists of modifying uninhabited portions of a home, such as a crawlspace, garage, or unfinished basement, with flood damage-resistant materials to allow floodwaters to enter the structure without causing damage (see Figure 7-2).

Figure 7-2. Wet Floodproofing Example



Source: FEMA P-312, June 30, 2014

Wet floodproofing requires portions of the building to be cleared of valuable items and mechanical utilities. A key component of wet floodproofing is providing openings large enough for the water to flow through the structure, such that the elevation of the water in the structure is equal to the elevation of the water outside of the structure. This equilibrium of floodwater prevents hydrostatic pressure from damaging structural walls.

7.8 DIRECT DRAINAGE AWAY FROM THE BUILDING

In some cases, there are things that the property owner can do on-site such as directing shallow floodwater away from a floodprone structure. Shallow flooding can often be kept away from a structure if some simple improvements are made to the yard. Sometimes structures are built at the bottom of a hill or in a natural drainage way or storage area, so that water naturally flows toward them.

One solution is to regrade the yard. If water flows toward the building, a new swale or wall can direct the flow to the street or a drainage way. Filling and grading next to the building can also direct shallow flooding away. Although water may remain in the yard temporarily, it is kept away from the structure. When these types of drainage modifications are made, care must be taken not to adversely affect the drainage patterns of adjacent properties. Over time, the swales along the lot lines or in the back yard may get filled in. Property owners build fences, garages, sheds, swimming pools, and other obstructions up to the lot line. These drainage problems can be fixed by removing the obstructions and restoring the swales so they will carry water away from the building.

7.9 DRAINAGE MAINTENANCE

Dumping into the drainage system is a Town of Shandaken violation. Debris can accumulate and restrict the flow of stormwater, increasing the potential of localized flooding.

7.10 SEWER IMPROVEMENTS

Heavy rains can saturate the soil and infiltrate the sanitary sewer system through leaky joints or cracks in the pipes. The inflow of stormwater floods the sanitary sewer system, causing water to back up into the home through lower-level plumbing fixtures. This occurrence can be prevented by installing a sewer backflow preventer (see Figure 7-3). A backflow preventer will allow the sanitary sewer water to flow freely from the home to the sewer but restrict the reverse flow. Backflow preventers do require maintenance and can fail if debris in the sewer prevents the valve from sealing properly. An overhead sewer system pumps wastewater from basement level plumbing fixtures up to an elevation near the ground level, where it can drain by gravity into the sewer service line. This higher sewer makes it unlikely that water will back up into the building.

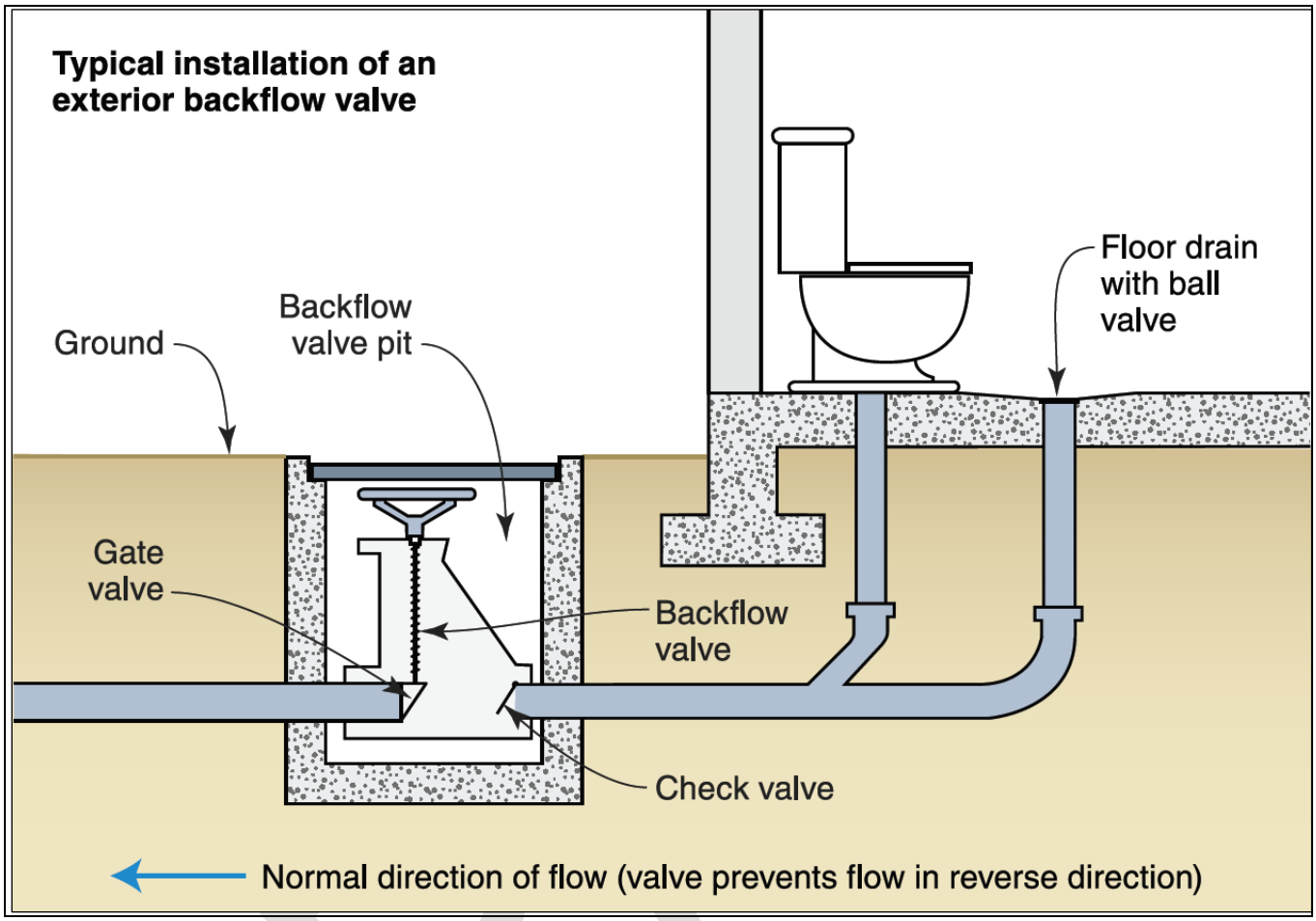
7.11 TEMPORARY BARRIERS

Several types of temporary barriers are available to address typical flooding problems. They work to direct drainage away from structures with the same principles as permanent barriers, such as floodwalls or levees, but can be removed, stored, and reused in subsequent flood events.

7.12 NATURAL RESOURCE PROTECTION

Care should be taken to maintain the streams, wetlands, and other natural resources within a floodplain or repetitive loss area. Removing debris from streams and channels prevents obstructions. Preserving and restoring natural areas provides flood protection, preserves water quality, and provides natural habitat.

Figure 7-3. Sewer Backflow Valve Installation Example



Source: FEMA P-312, June 30, 2014

7.13 EMERGENCY SERVICES

Advance identification of an impending storm is only the first part of an effective Flood Warning and Response Plan. To truly realize the benefit of an early flood warning system, the warning must be disseminated quickly to floodplain occupants, repetitive loss areas and critical facilities. Appropriate response activities must then be implemented, such as road closures, direct evacuations, sandbagging, and moving building contents above flood levels. Finally, a community should take measures to protect public health and safety and facilitate recovery. These measures may include cleaning up debris and garbage, clearing streets, and ensuring that citizens have shelter, food, and safe drinking water.

7.14 PUBLIC INFORMATION

One of the most important, and often overlooked, aspects of mitigation is public awareness. Awareness starts with recognition of the flood risk. FIRM panels, which designate areas of a community according to various levels

of flood risk, can be viewed at www.FEMA.gov. Also, real estate transactions require disclosure of known flood hazards. The next level of awareness is related to hazard mitigation measures. Often homeowners can greatly reduce their risks with mitigation efforts if they are aware of the risks. For that reason, as part of this analysis, every property owner in the initially designated repetitive loss area has been contacted and informed of the opportunity to review this report.

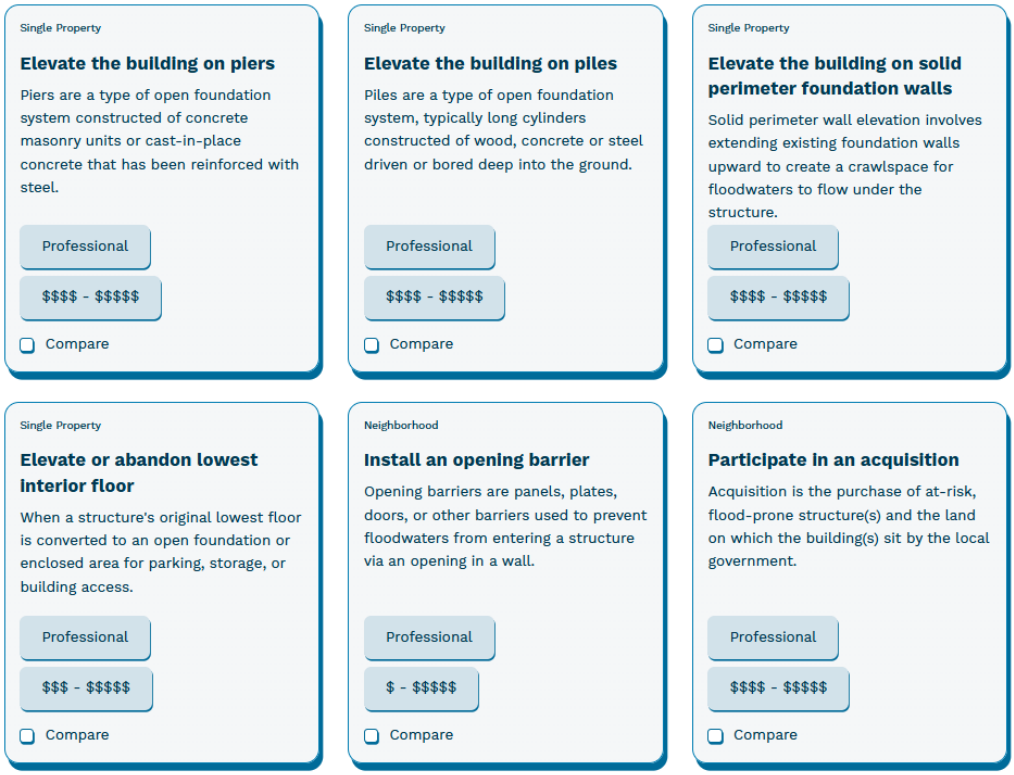
CRS Activity 330 – Flood Response Preparation

Provide the public with information needed to increase flood hazard awareness and to motivate actions to reduce flood damage, citizen safety messages

The Town's ongoing CRS outreach projects include an annual outreach letter to every resident within the SFHA and the sub-repetitive loss areas. Annual outreach postcard to all in the Town, social media delivered messages focused on flood risk, flood insurance, protect people and property, building permit standards, and natural function messages. The Town has developed social media messages and a schedule to deliver them related to a flood event activation. These messages cover before, during, and after the event topics that provide direct guidance to their citizens.

Interactive websites such as www.floodsmart.gov and https://www.reducefloodrisk.org/ offer a user-friendly, visual approach for the Town and its citizens to explore mitigation actions by building details. www.floodsmart.gov demonstrates potential discounts based on mitigation efforts such as structural elevation. The Association of State Floodplain Managers developed the https://www.reducefloodrisk.org/ as a resource for property owners to explore mitigation actions, flood insurance information, and property owner guidance to help navigate risk reduction options.

Guided Experience Start - Reduce Flood Risk



Part 2: Analysis of Individual Repetitive Loss Areas

8. REPETITIVE LOSS AREA DESIGNATION

Upon further review of the flooding sources, the Town of Shandaken, New York, has determined that the entire FEMA-designated floodplain should receive an annual outreach covering the same priority messages mailed to the existing 11 sub-repetitive loss areas. This decision reflects the Town's geographic setting within a narrow Catskills valley, where steep terrain funnels stormwater and riverine flooding into nearly all developed areas. As highlighted in the Ulster County Hazard Mitigation Plan, the Esopus Creek and its tributaries frequently overtop their banks during heavy rainfall and snowmelt events, and the confined valley setting amplifies flood impact across the community.

FEMA CRS Activity 502 Compliance Statement:

To meet the requirements of Activity 502, the Town of Shandaken will conduct an annual hard copy mailing to all primary structures located within the designated RL area. For continuity and enhanced outreach, properties within the original 2019 RL areas will continue to receive an expanded version of this annual mailing. The Town recognizes the 11 identified subareas within the Special Flood Hazard Area (SFHA) as a key target audience for ongoing communication efforts.

The 2025 RLAA update has reconfirmed the 2018 defined repetitive loss areas. These areas demonstrate higher concentrations of repetitive loss properties. The 11 subareas will remain the focus of the continued repetitive loss area targeted outreach, with each receiving its own annual letter. While the remainder of the floodplain will receive a similar informational letter to expand outreach and citizen engagement. This approach balances the recognition of Shandaken's valley-wide flood risk with the need to provide focused attention to the most floodprone neighborhoods.

The following 11 subareas of the Town of Shandaken's floodplain have been identified as continued critical communication piece for the citizens to remain a target area. For CRS purposes, these remain the 502 Repetitive Loss Areas.

- Subarea – Big Indian 1 Repetitive Loss Area
- Subarea – Big Indian 2 Repetitive Loss Area
- Subarea – Big Indian 3 Repetitive Loss Area
- Subarea – Mt. Tremper- 1 Repetitive Loss Area
- Subarea – Mt. Tremper- 2 Repetitive Loss Area
- Subarea – Mt. Tremper- 3 Repetitive Loss Area
- Subarea – Phoenicia-1 Repetitive Loss Area
- Subarea – Phoenicia-2 Repetitive Loss Area
- Subarea – Phoenicia-3 Repetitive Loss Area
- Subarea – Shandaken-1 Repetitive Loss Area
- Subarea – Shandaken-2 Repetitive Loss Area

9. SUBAREA – BIG INDIAN-1 REPETITIVE LOSS AREA

9.1 PROBLEM STATEMENT

Repetitive loss area SRLA-1 encompasses the area from Esopus Creek to Oliverea Road and from Eagle Mountain Road bridge across the Esopus Creek until it reaches the intersection of Oliverea Road and Eagle Mountain Road. The area moves south along Oliverea Road for about 800 feet.

Figure 9-1 shows the Big Indian-1 Repetitive Loss Area, 2017 FEMA Effective DFIRMs, and building footprints of structures located in the area. The targeted repetitive loss property for this area is located within the floodplain. The property is in Zone X (0.2 percent annual chance flood hazard), which has significant risk from a 500-year flood. Repetitive riverine flooding caused by overbank flooding from the Esopus Creek.

9.2 IDENTIFIED REPETITIVE LOSS PROPERTY

Table 9-1 lists the FEMA-designated repetitive loss property within this repetitive loss area.

Table 9-1. Repetitive Loss Properties in Big Indian-1 Repetitive Loss Area

FEMA RL #	RL Map #	Flood Dates of Previous Claims	Average Claim Paid	Mitigated?
217500	1	8/28/2011; 9/18/2012	$7,600	No

Identified Flood Cause: Property is located in the floodplain. Repetitive flooding possibly caused by riverine flooding when storm flows exceed the capacity of the Esopus Creek. No reported losses since 2012.

9.3 PROPERTIES INCLUDED IN REPETITIVE LOSS AREA

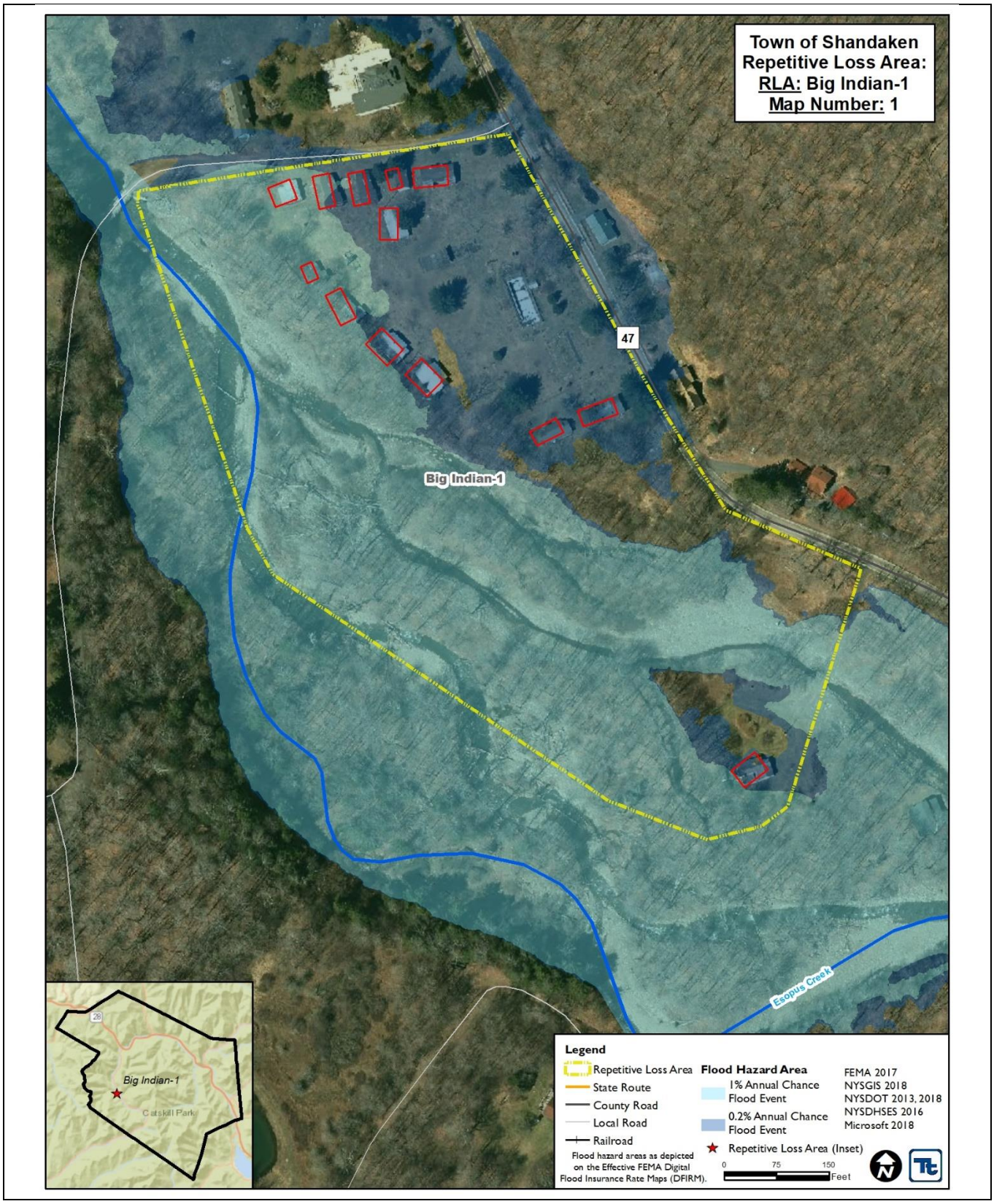
The repetitive loss Map #1 property is the only property included in this repetitive loss area. It has 13 insurable buildings. Table 9-2 provides general information for the properties, along with mitigation measures that could be employed to address repetitive flood losses. For private properties, the decision on whether to implement the identified mitigation measures resides with the private property owner. It should be noted that most of the properties in this area are not year-round residences. These measures are recommended due to the flood risks, but owners are not obligated to implement them. The 2025 assessment aligns with the 2018 RLAA for potential mitigation actions.

Table 9-2. All Properties in Big Indian-1 Repetitive Loss Area

Property ID	Number of Insurable Buildings	Building Description		Probable Mitigation Measures
		Foundation	Condition	
BI-1	1	Slab	Normal	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education
BI-2	1	Slab	Normal	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education
BI-3	1	Slab	Normal	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education
BI-4	1	Slab	Normal	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education
BI-5	1	Slab	Normal	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education
BI-6	1	Slab	Normal	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education
BI-7	1	Slab	Normal	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education

Property ID	Number of Insurable Buildings	Building Description		Probable Mitigation Measures
		Foundation	Condition	
BI-8	1	Slab	Normal	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education
BI-9	1	Slab	Normal	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education
BI-10	1	Slab	Normal	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education
BI-11	1	Slab	Normal	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education
BI-12	1	Slab	Normal	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education
BI-13	1	Slab	Normal	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education
Total	**13**			

Figure 9-1. Subarea – Big Indian-1 Repetitive Loss Area



10. SUBAREA – BIG INDIAN-2 REPETITIVE LOSS AREA

10.1 PROBLEM STATEMENT

Repetitive loss area SRLA-2 encompasses the area along Esopus Creek and Oliverea Road. The area starts about 700 ft north of the intersection of Mckinley Hollow Road and Oliverea Road and continues south until 1,000 feet south of that same intersection. The area also runs from the intersection of Brown Road and Rustic Road and continues east until Oliverea Road. The repetitive loss area is mostly covered by the repetitive loss area boundary based on the 100-year floodplain.

Figure 10-1 shows the Big Indian-2 Repetitive Loss Area, 2017 FEMA Effective DFIRMs, and building footprints of structures located in the area. The targeted repetitive loss properties for this area are located within the floodplain. The properties are in Zone A, which has significant risk from a 100-year flood. Repetitive riverine flooding caused by overbank flooding from the Esopus Creek. The 2025 assessment aligns with the 2018 RLAA for potential mitigation actions.

10.2 IDENTIFIED REPETITIVE LOSS PROPERTY

Table 10-1 lists the FEMA-designated repetitive loss property within this repetitive loss area.

Table 10-1. Repetitive Loss Properties in Big Indian-2 Repetitive Loss Area

FEMA RL #	RL Map #	Flood Dates of Previous Claims	Average Claim Paid	Mitigated?
138539 *SRL	2	12/17/2000; 4/2-4/3/2005; 9/28-10/1/2010; 8/28/2011	$58,867	No
206362	2	4/2-4/3/2005; 8/28/2011	$14,577	No
208160	2	4/2-4/3/2005; 8/28/2011	$30,160	Yes
196453	2	4/2-4/3/2005; 9/28-10/1/2010; 8/28/2011; 11/4/2011; 12/7/2011	$21,050	Yes
196493	2	4/2-4/3/2005; 9/28-10/1/2010; 8/28/2011; 9/18/2012	$10,578	Yes

Identified Flood Cause: Properties are located in the floodplain. Repetitive flooding possibly caused by riverine flooding when storm flows exceed the capacity of the Esopus Creek. No reported losses since 2011.
Note: RL #196453 and 196493 were not used in the delineation of the area.

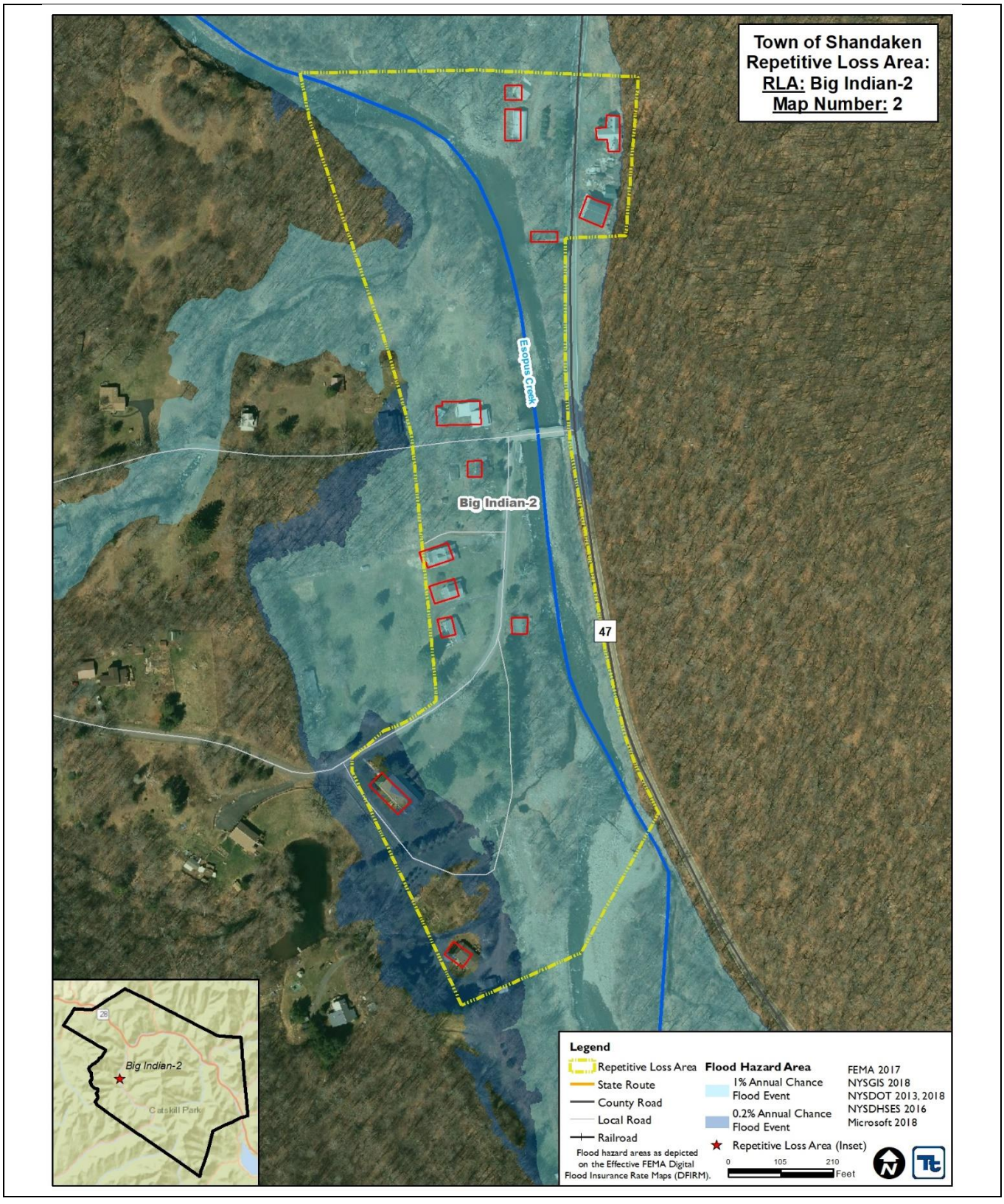
10.3 PROPERTIES INCLUDED IN REPETITIVE LOSS AREA

The repetitive loss Map #2 property is the only property included in this repetitive loss area. It has eight insurable buildings. Table 10-2 provides general information for the properties, along with mitigation measures that could be employed to address repetitive flood losses. For private properties, the decision on whether to implement the identified mitigation measures resides with the private property owner. These measures are recommended due to the flood risks, but owners are not obligated to implement them.

Table 10-2. All Properties in Big Indian-2 Repetitive Loss Area

Property ID	Number of Insurable Buildings	Building Description		Probable Mitigation Measures
		Foundation	Condition	
BI-14	1	Crawlspace	Fair	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education
BI-15	1	Basement	Normal	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education
BI-16	1	Basement	Normal	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education
BI-17	1	Basement	Normal	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education
BI-18	1	Crawlspace	Excellent	Structure substantially improved in qwsa; flood vents installed
BI-19	1	Crawlspace	Excellent	Structure substantially improved in 2017; flood vents installed
BI-20	1	Basement	Normal	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education
BI-21	1	Crawlspace	Normal	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education
Total	**8**			

Figure 10-1. Subarea – Big Indian-2 Repetitive Loss Area



11. SUBAREA – BIG INDIAN-3 REPETITIVE LOSS AREA

11.1 PROBLEM STATEMENT

Repetitive loss area SRLA-3 encompasses several parcels between Church Road and Birch Creek. The area is bounded by Esopus Creek to the South, Birch Creek, and the confluence with Espose Creek. The repetitive loss area is entirely covered by the new repetitive loss area boundary based on the 100-year floodplain.

Figure 11-1 shows the Big Indian-3 Repetitive Loss Area, 2017 FEMA Effective DFIRMs, and building footprints of structures located in the area. The targeted repetitive loss property for this area is located within the floodplain. The property is in Zone A, which has significant risk from a 100-year flood. Repetitive riverine flooding caused by overbank flooding from the Birch Creek and Esopus Creek. The 2025 assessment aligns with the 2018 RLAA for potential mitigation actions.

11.2 IDENTIFIED REPETITIVE LOSS PROPERTY

Table 11-1 lists the FEMA-designated repetitive loss property within this repetitive loss area.

Table 11-1. Repetitive Loss Properties in Big Indian-3 Repetitive Loss Area

FEMA RL #	RL Map #	Flood Dates of Previous Claims	Average Claim Paid	Mitigated?
206363	3	4/3/2005; 8/29/2011	$8,074	No

Identified Flood Cause: Property is located in the floodplain. Repetitive flooding possibly caused by riverine flooding when storm flows exceed the capacity of the Birch Creek and Esopus Creek. No reported losses since 2011.

11.3 PROPERTIES INCLUDED IN REPETITIVE LOSS AREA

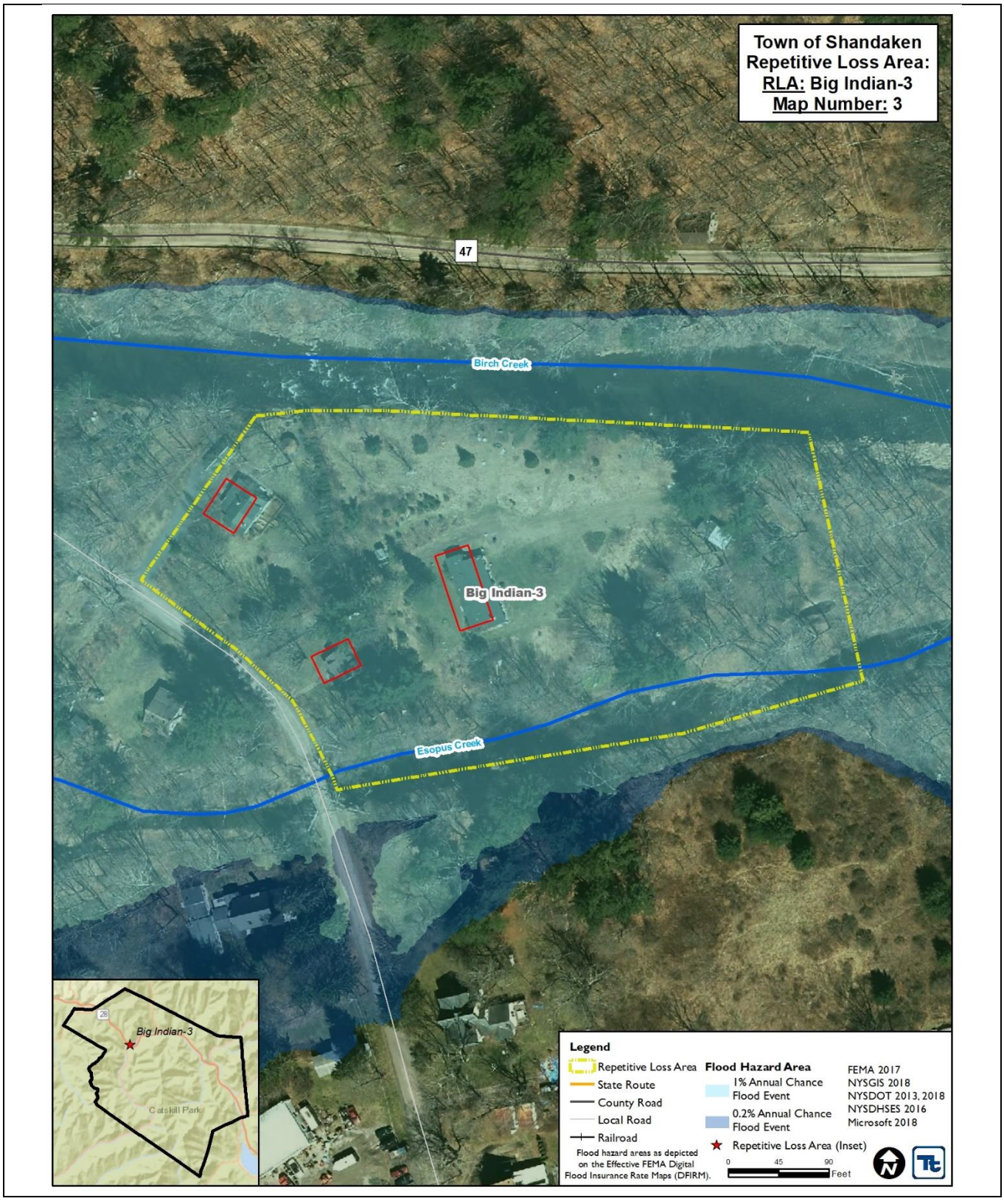
The repetitive loss Map #3 property is the only property in this repetitive loss area. It has three insurable buildings. Table 11-2 provides general information for the properties, along with mitigation measures that could be employed to address repetitive flood losses. For private properties, the decision on whether to implement the identified mitigation measures resides with the private property owner. These measures are recommended due to the flood risks, but owners are not obligated to implement them.

Table 11-2. All Properties in Big Indian-3 Repetitive Loss Area

Property ID	Number of Insurable Buildings	Building Description		Probable Mitigation Measures
		Foundation	Condition	
BI-22	1	Crawlspace	Excellent	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education

Property ID	Number of Insurable Buildings	Building Description		Probable Mitigation Measures
		Foundation	Condition	
BI-23	1	Slab	Normal	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education
BI-24	1	Crawlspace	Excellent	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education
Total	**3**			

Figure 11-1. Subarea – Big Indian-3 Repetitive Loss Area



12. SUBAREA – SHANDAKEN-1 REPETITIVE LOSS AREA

12.1 PROBLEM STATEMENT

Repetitive loss area SRLA-4 encompasses the area between Esopus Creek, Route 28, and Route 42. The area runs east for about 525 feet along Route 28 from where the bridge of Route 28 crosses Esopus Creek and about 650 feet north along Route 42. The repetitive loss area is entirely covered by the new repetitive loss area boundary based on the 100-year floodplain.

Figure 12-1 shows the Shandaken-1 Repetitive Loss Area, 2017 FEMA Effective DFIRMs, and building footprints of structures located in the area. The targeted repetitive loss property for this area is located within the floodplain. The property is in Zone A, which has significant risk from a 100-year flood. Repetitive riverine flooding caused by overbank flooding from the Esopus Creek. The 2025 assessment aligns with the 2018 RLAA for potential mitigation actions.

12.2 IDENTIFIED REPETITIVE LOSS PROPERTY

Table 12-1 lists the FEMA-designated repetitive loss property within this repetitive loss area.

Table 12-1. Repetitive Loss Properties in Shandaken-1 Repetitive Loss Area

FEMA RL #	RL Map #	Flood Dates of Previous Claims	Average Claim Paid	Mitigated?
209757	**10**	**4/3/2005; 8/29/2011**	**$4,171**	**No**
139653	10	4/2/2005; 8/28/2011	$ 38,823	No

Identified Flood Cause: Property is located in the floodplain. Repetitive flooding possibly caused by riverine flooding when storm flows exceed the capacity of the Esopus Creek. No reported losses since 2011.

12.3 PROPERTIES INCLUDED IN REPETITIVE LOSS AREA

The repetitive loss Map #11 property is the only property included in this repetitive loss area. It has eight insurable buildings. Table 12-2 provides general information for the properties, along with mitigation measures that could be employed to address repetitive flood losses. For private properties, the decision on whether to implement the identified mitigation measures resides with the private property owner. These measures are recommended due to the flood risks, but owners are not obligated to implement them.

Table 12-2. All Properties in Shandaken-1 Repetitive Loss Area

Property ID	Number of Insurable Buildings	Building Description		Probable Mitigation Measures
		Foundation	Condition	
S-1	1	Basement	Normal	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education
S-2	1	Basement	Normal	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education
S-3	1	Basement	Normal	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education
S-4	1	Basement	Normal	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education
S-5	1	Crawlspace	Normal	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education
S-6	1	Crawlspace	Normal	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education
S-7	1	Crawlspace	Normal	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education

Property ID	Number of Insurable Buildings	Building Description		Probable Mitigation Measures
		Foundation	Condition	
S-8	1	Basement	Normal	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education
Total	**8**			

Figure 12-1. Subarea – Shandaken-1 Repetitive Loss Area

13. SUBAREA – SHANDAKEN-2 REPETITIVE LOSS AREA

13.1 PROBLEM STATEMENT

Repetitive loss area SRLA-5 encompasses several parcels between Esopus Creek and Route 28. The area is about 300 feet west of Route 28 and about 400 feet east of Esopus Creek. The area runs north to south for about 470 feet and runs east to west for about 580 feet. The repetitive loss area is entirely covered by the new repetitive loss area boundary based on the 100-Year Floodplain.

Figure 13-1 shows the Shandaken-2 Repetitive Loss Area, 2017 FEMA Effective DFIRMs, and building footprints of structures located in the area. The targeted repetitive loss property for this area is located within the floodplain. The property is in Zone A, which has significant risk from a 100-year flood. Repetitive riverine flooding caused by overbank flooding from the Esopus Creek. The 2025 assessment aligns with the 2018 RLAA for potential mitigation actions.

13.2 IDENTIFIED REPETITIVE LOSS PROPERTY

Table 13-1 lists the FEMA-designated repetitive loss property within this repetitive loss area.

Table 13-1. Repetitive Loss Properties in Shandaken-2 Repetitive Loss Area

FEMA RL #	RL Map #	Flood Dates of Previous Claims	Average Claim Paid	Mitigated?
209756	11	4/2/2005; 8/29/2011	$2,870	No

Identified Flood Cause: Property is located in the floodplain. Repetitive flooding possibly caused by riverine flooding when storm flows exceed the capacity of the Esopus Creek. No reported losses since 2011.

13.3 PROPERTIES INCLUDED IN REPETITIVE LOSS AREA

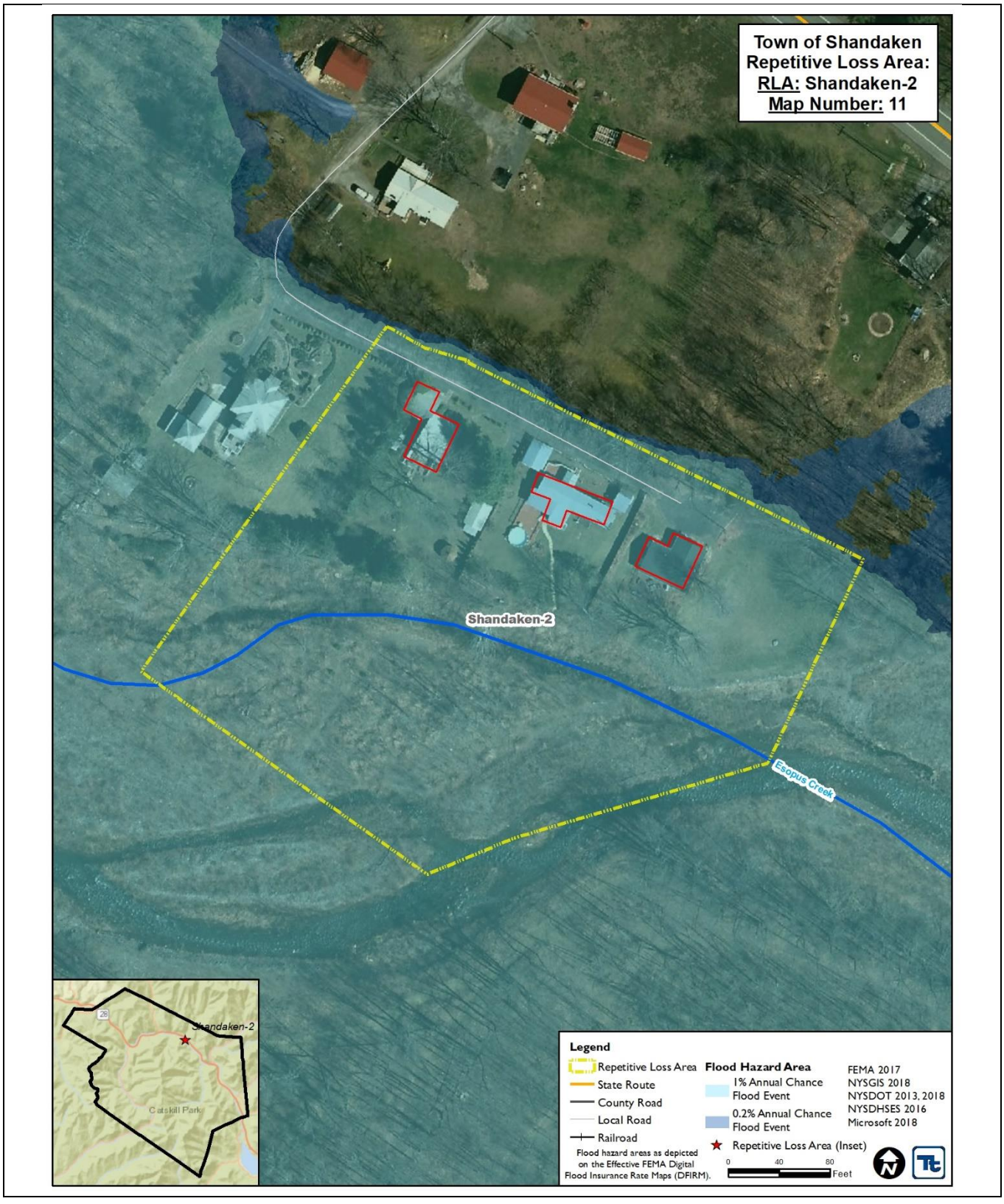
The repetitive loss Map #12 property is the only property included in this repetitive loss area. It has three insurable buildings. Table 13-2 provides general information for the properties, along with mitigation measures that could be employed to address repetitive flood losses. For private properties, the decision on whether to implement the identified mitigation measures resides with the private property owner. These measures are recommended due to the flood risks, but owners are not obligated to implement them.

Table 13-2. All Properties in Shandaken-2 Repetitive Loss Area

Property ID	Number of Insurable Buildings	Building Description		Probable Mitigation Measures
		Foundation	Condition	
S-9	1	Crawlspace	Fair	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education

Property ID	Number of Insurable Buildings	Building Description		Probable Mitigation Measures
		Foundation	Condition	
S-10	1	Crawlspace	Good	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education
S-11	1	Crawlspace	Good	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education
Total	**3**			

Figure 13-1. Subarea – Shandaken-2 Repetitive Loss Area



14. SUBAREA – PHOENICIA-1 REPETITIVE LOSS AREA

14.1 PROBLEM STATEMENT

Repetitive loss area SRLA-6 encompasses the area along the Esopus Creek. The area starts about 450 feet north of the intersection of Main Street and Route 28 and continues south until about 480 feet south of the intersection of Bridge Street and Route 28. The area also runs north from the intersection of Bridge Street and Route 28 and continues until it reaches the intersection of Route 214 and School Lane along the Stony Clove Creek. The repetitive loss area is mostly covered by the new repetitive loss area boundary based on the 100-year floodplain.

Figure 14-1 shows the Phoenicia-1 Repetitive Loss Area, 2017 FEMA Effective DFIRMs, and building footprints of structures located in the area. The targeted repetitive loss properties for this area are located within the floodplain. The properties are primarily located in Zone A, which has significant risk from a 100-year flood, while one property is in Zone X (0.2 percent annual chance flood hazard). Repetitive riverine flooding caused by overbank flooding from the Esopus Creek and Stony Clove Creek. The 2025 assessment aligns with the 2018 RLAA for potential mitigation actions.

14.2 IDENTIFIED REPETITIVE LOSS PROPERTY

Table 14-1 lists the FEMA-designated repetitive loss property within this repetitive loss area.

Table 14-1. Repetitive Loss Properties in Phoenicia-1 Repetitive Loss Area

FEMA RL #	RL Map #	Flood Dates of Previous Claims	Average Claim Paid	Mitigated?
141214 *SRL	7	1/19/1996; 4/2-4/3/2005; 9/30-10/1/2010; 8/27-8/28/2011	$62,879	No
196351	7	4/2-4/3/2005; 9/30-10/1/2010; 8/27-8/28/2011	$19,371	No
196683	7	9/28/2003; 9/30-10/1/2010	$1,711	No
196798	7	9/30-10/1/2010; 12/1/2010; 8/27-8/28/2011	$23,415	No
196831	7	4/2-4/3/2005; 12/1/2010	$9,692	No
200723	7	4/15/2007; 8/27-8/28/2011	$1,587	No
202646	7	6/28/2006; 8/27-8/28/2011	$12,357	No
204146	7	4/2-4/3/2005; 8/27-8/28/2011	$41,273	No
208620	7	9/30-10/1/2010; 8/27-8/28/2011	$45,469	No
210526	7	4/2-4/3/2005; 8/27-8/28/2011	$43,645	No
210726	7	12/1/2010; 8/27-8/28/2011	$18,118	No
212955	7	4/2-4/3/2005; 8/27-8/28/2011	$20,298	No

Identified Flood Cause: Properties are located in the floodplain. Repetitive flooding possibly caused by riverine flooding when storm flows exceed the capacity of the Esopus Creek and Stony Clove Creek. No reported losses since 2011.

14.3 PROPERTIES INCLUDED IN REPETITIVE LOSS AREA

The repetitive loss Map #8 property is the only property included in this repetitive loss area. It has 110 insurable buildings. Table 14-2 provides general information for the properties, along with mitigation measures that could be

employed to address repetitive flood losses. For private properties, the decision on whether to implement the identified mitigation measures resides with the private property owner. These measures are recommended due to the flood risks, but owners are not obligated to implement them.

Table 14-2. All Properties in Phoenicia-1 Repetitive Loss Area

Property ID	Number of Insurable Buildings	Building Description		Probable Mitigation Measures
		Foundation	Condition	
P-1	1	Basement	Normal	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education
P-2	1	Crawlspace	Normal	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education
P-3	1	Crawlspace	Normal	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education
P-4	1	Crawlspace	Normal	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education
P-5	1	Crawlspace	Normal	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education
P-6	1	Basement	Normal	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education
P-7	1	Basement	Normal	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education
P-8	1	Basement	Good	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education
P-9	1	Basement	Fair	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education

Property ID	Number of Insurable Buildings	Building Description		Probable Mitigation Measures
		Foundation	Condition	
P-10	1	Basement	Good	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education
P-11	1	Basement	Normal	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education
P-12	1	Basement	Normal	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education
P-13	1	Basement	Normal	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education
P-14	1	Basement	Normal	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education
P-15	1	Basement	Normal	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education
P-16	1	Basement	Normal	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education
P-17	1	Basement	Normal	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education
P-18	1	Slab	Normal	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education
P-19	1	Slab	Normal	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education

Property ID	Number of Insurable Buildings	Building Description		Probable Mitigation Measures
		Foundation	Condition	
P-20	1	Basement	Good	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education
P-21	1	Basement	Normal	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education
P-22	1	Basement	Normal	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education
P-23	1	Basement	Good	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education
P-24	1	Basement	Good	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education
P-25	1	Basement	Normal	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education
P-26	1	Basement	Good	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education
P-27	1	Basement	Normal	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education
P-28	1	Basement	Excellent	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education
P-29	1	Basement	Fair	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education

Property ID	Number of Insurable Buildings	Building Description		Probable Mitigation Measures
		Foundation	Condition	
P-30	1	Basement	Good	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education
P-31	1	Basement	Normal	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education
P-32	1	Basement	Normal	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education
P-33	1	Basement	Normal	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education
P-34	1	Crawlspace	Normal	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education
P-35	1	Slab	Normal	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education
P-36	1	Basement	Normal	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education
P-37	1	Basement	Good	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education
P-38	1	Slab	Normal	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education
P-39	1	Slab	Normal	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education

Property ID	Number of Insurable Buildings	Building Description		Probable Mitigation Measures
		Foundation	Condition	
P-40	1	Slab	Normal	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education
P-41	1	Basement	Normal	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education
P-42	1	Basement	Normal	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education
P-43	1	Slab	Normal	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education
P-44	1	Slab	Normal	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education
P-45	1	Slab	Excellent	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education
P-46	1	Slab	Normal	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education
P-47	1	Slab	Normal	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education
P-48	1	Slab	Normal	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education
P-49	1	Basement	Good	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education

Property ID	Number of Insurable Buildings	Building Description		Probable Mitigation Measures
		Foundation	Condition	
P-50	1	Basement	Excellent	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education
P-51	1	Basement	Excellent	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education
P-52	1	Basement	Excellent	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education
P-53	1	Basement	Normal	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education
P-54	1	Basement	Normal	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education
P-55	1	Basement	Normal	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education
P-56	1	Basement	Normal	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education
P-57	1	Slab	Normal	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education
P-58	1	Slab	Normal	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education
P-59	1	Basement	Good	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education

Property ID	Number of Insurable Buildings	Building Description		Probable Mitigation Measures
		Foundation	Condition	
P-60	1	Slab	Normal	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education
P-61	1	Basement	Good	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education
P-62	1	Basement	Good	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education
P-63	1	Crawlspace	Normal	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education
P-64	1	Basement	Good	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education
P-65	1	Basement	Good	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education
P-66	1	Crawlspace	Excellent	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education
P-67	1	Crawlspace	Excellent	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education
P-68	1	Basement	Normal	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education
P-69	1	Basement	Normal	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education

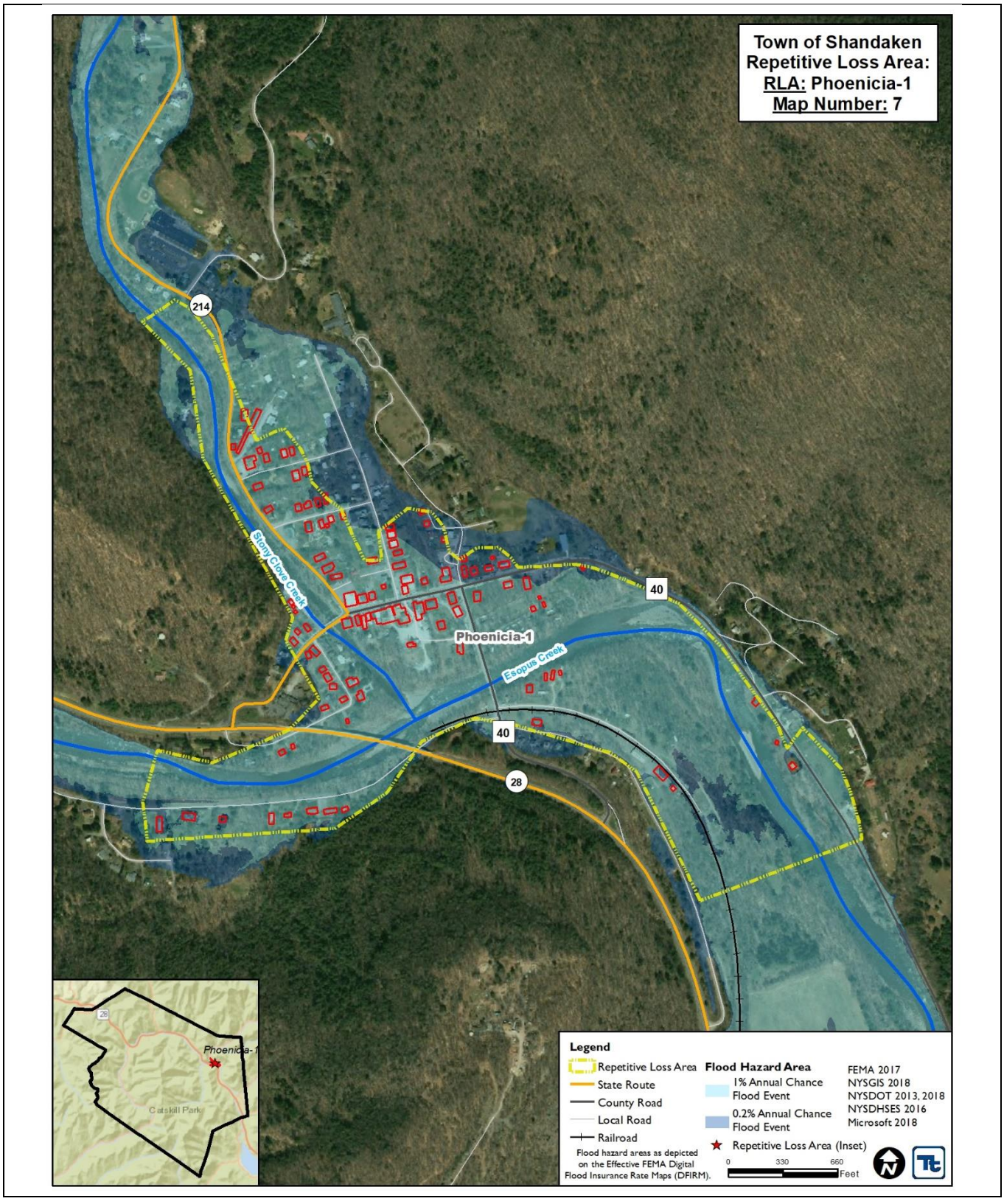
Property ID	Number of Insurable Buildings	Building Description		Probable Mitigation Measures
		Foundation	Condition	
P-70	1	Basement	Good	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education
P-71	1	Basement	Normal	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education
P-72	1	Basement	Good	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education
P-73	1	Crawlspace	Normal	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education
P-74	1	Crawlspace	Normal	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education
P-75	1	Crawlspace	Excellent	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education
P-76	1	Crawlspace	Excellent	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education
P-77	1	Slab	Normal	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education
P-78	1	Slab	Normal	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education
P-79	1	Slab	Normal	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education

Property ID	Number of Insurable Buildings	Building Description		Probable Mitigation Measures
		Foundation	Condition	
P-80	1	Slab	Normal	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education
P-81	1	Slab	Normal	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education
P-82	1	Slab	Normal	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education
P-83	1	Slab	Normal	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education
P-84	1	Crawlspace	Excellent	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education
P-85	1	Slab	Normal	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education
P-86	1	Slab	Normal	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education
P-87	1	Slab	Normal	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education
P-88	1	Slab	Good	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education
P-89	1	Slab	Good	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education

Property ID	Number of Insurable Buildings	Building Description		Probable Mitigation Measures
		Foundation	Condition	
P-90	1	Slab	Good	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education
P-91	1	Slab	Good	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education
P-92	1	Slab	Normal	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education
P-93	1	Slab	Normal	Structure elevated in 2017
P-94	1	Crawlspace	Good	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education
P-95	1	Slab	Normal	Structure was substantially damaged by fire in 2011; Rebuilt to code in 2015
P-96	1	Basement	Fair	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education
P-97	1	Crawlspace	Normal	Structure elevated in 2017
P-98	1	Slab	Normal	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education
P-99	1	Slab	Normal	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education
P-100	1	Slab	Normal	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education
P-101	1	Slab	Normal	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education

Property ID	Number of Insurable Buildings	Building Description		Probable Mitigation Measures
		Foundation	Condition	
P-102	1	Slab	Normal	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education
P-103	1	Slab	Normal	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education
P-104	1	Slab	Normal	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education
P-105	1	Basement	Excellent	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education
P-106	1	Slab	Normal	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education
P-107	1	Basement	Good	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education
P-108	1	Slab	Normal	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education
P-109	1	Slab	Normal	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education
P-110	1	Slab	Normal	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education
Total	**110**			

Figure 14-1. Subarea – Phoenicia-1 Repetitive Loss Area



15. SUBAREA – PHOENICIA-2 REPETITIVE LOSS AREA

15.1 PROBLEM STATEMENT

Repetitive loss area SRLA-7 encompasses the area between Woodland Valley Road and Woodland Creek. The area is about 950 feet south of the intersection of Woodland Valley Road and Grandview Acres Road and continues south for about 2,775 feet. The repetitive loss area is mostly covered by the new repetitive loss area boundary based on the 100-year floodplain.

Figure 15-1 shows the Phoenicia-2 Repetitive Loss Area, 2017 FEMA Effective DFIRMs, and building footprints of structures located in the area. The targeted repetitive loss properties for this area are located within the floodplain. The properties are located in Zone A, which has significant risk from a 100-year flood. Repetitive riverine flooding caused by overbank flooding from Woodland Creek. The 2025 assessment aligns with the 2018 RLAA for potential mitigation actions.

15.2 IDENTIFIED REPETITIVE LOSS PROPERTY

Table 15-1 lists the FEMA-designated repetitive loss property within this repetitive loss area.

Table 15-1. Repetitive Loss Properties in Phoenicia-2 Repetitive Loss Area

FEMA RL #	RL Map #	Flood Dates of Previous Claims	Average Claim Paid	Mitigated?
54561	8	9/27/1985; 4/4/1987	$2,567	Yes
204036	8	4/2/2005; 8/28/2011	$2,721	No

Identified Flood Cause: Properties are located in the floodplain. Repetitive flooding possibly caused by riverine flooding when storm flows exceed the capacity of the Woodland Creek. No reported losses since 2011.

15.3 PROPERTIES INCLUDED IN REPETITIVE LOSS AREA

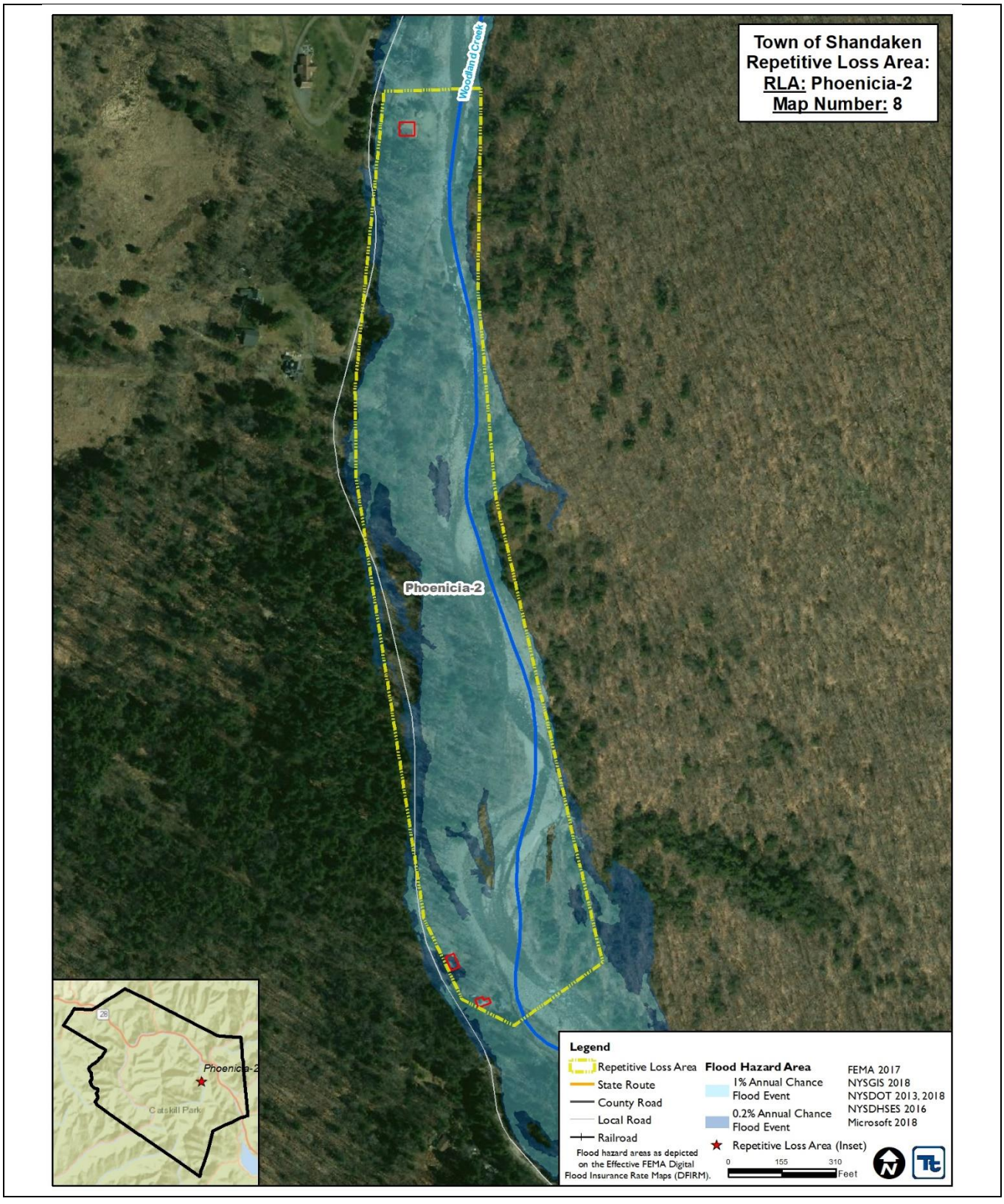
The repetitive loss Map #9 property is the only property included in this repetitive loss area. It has three insurable buildings. Table 15-2 provides general information for the properties, along with mitigation measures that could be employed to address repetitive flood losses. For private properties, the decision on whether to implement the identified mitigation measures resides with the private property owner. These measures are recommended due to the flood risks, but owners are not obligated to implement them.

Table 15-2. All Properties in Phoenicia-2 Repetitive Loss Area

Property ID	Number of Insurable Buildings	Building Description		Probable Mitigation Measures
		Foundation	Condition	
P-111	1	Crawlspace	Normal	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education

Property ID	Number of Insurable Buildings	Building Description		Probable Mitigation Measures
		Foundation	Condition	
P-112	1	Slab	Poor	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education
P-113	1	Slab	Poor	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education
Total	**3**			

Figure 15-1. Subarea – Phoenicia-2 Repetitive Loss Area



16. SUBAREA – PHOENICIA-3 REPETITIVE LOSS AREA

16.1 PROBLEM STATEMENT

Repetitive loss area SRLA-8 encompasses several parcels north of Woodland Valley Road. The area runs about 225 feet along Woodland Valley Road and about 225 feet north of Woodland Valley Road. Only a small portion of the new repetitive loss area boundary based on the 100-year floodplain is located in this repetitive loss area.

Figure 16-1 shows the Phoenicia-3 Repetitive Loss Area, 2017 FEMA Effective DFIRMs, and building footprints of structures located in the area. Note, the targeted repetitive loss property for this area is located approximately 200 ft from the end of the FEMA DFIRM study extent of the Woodland Creek and could not be determined as in or out of the floodplain. Repetitive riverine flooding caused by overbank flooding from Woodland Creek. The 2025 assessment aligns with the 2018 RLAA for potential mitigation actions.

16.2 IDENTIFIED REPETITIVE LOSS PROPERTY

Table 16-1 lists the FEMA-designated repetitive loss property within this repetitive loss area.

Table 16-1. Repetitive Loss Properties in Phoenicia-3 Repetitive Loss Area

FEMA RL #	RL Map #	Flood Dates of Previous Claims	Average Claim Paid	Mitigated?
203211	9	9/29/2010; 8/28/2011	$9,857	No

Identified Flood Cause: Property is located in the floodplain. Repetitive flooding possibly caused by riverine flooding when storm flows exceed the capacity of the Woodland Creek. No reported losses since 2011.

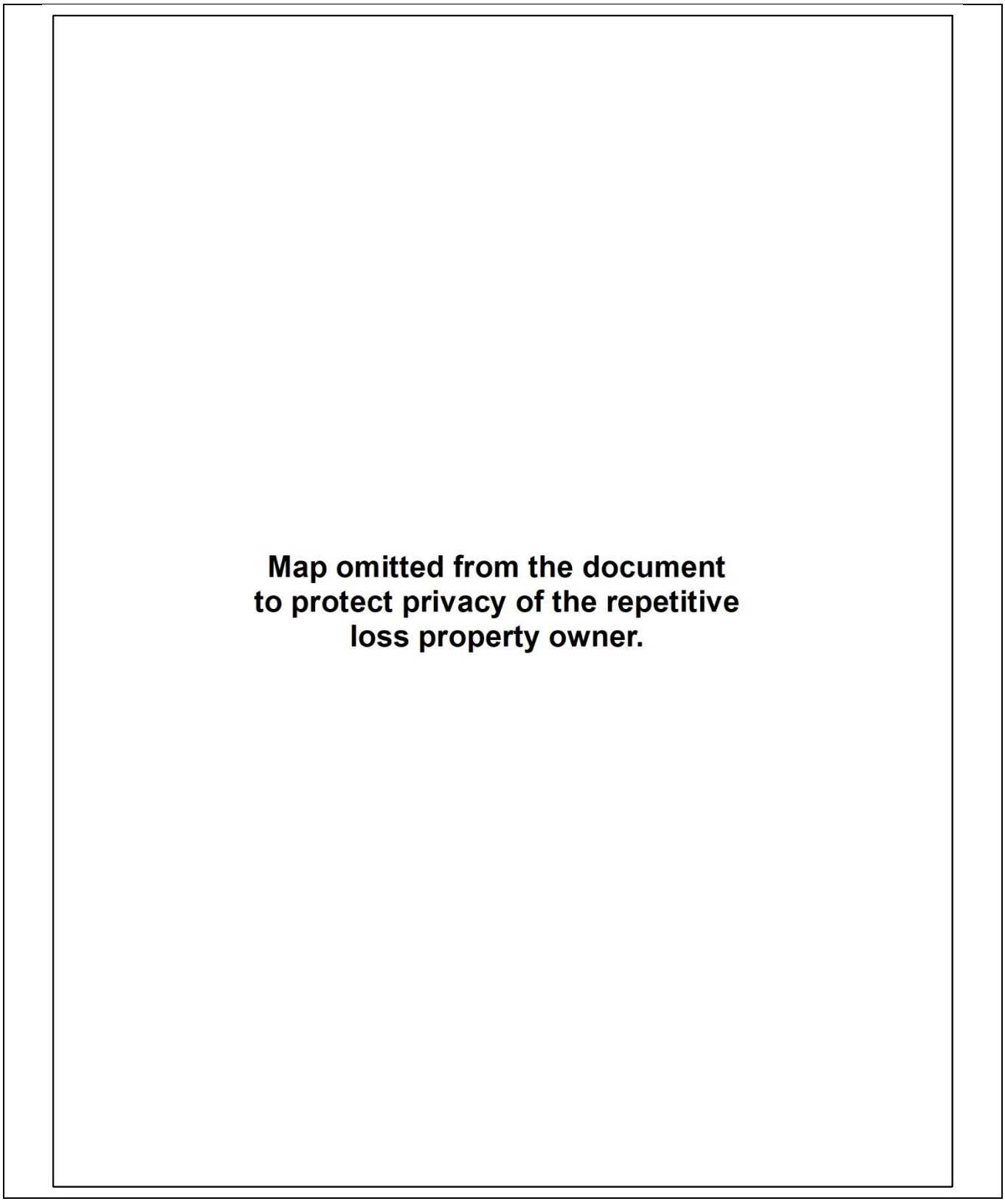
16.3 PROPERTIES INCLUDED IN REPETITIVE LOSS AREA

The repetitive loss Map #10 property is the only property included in this repetitive loss area. It has one insurable building without any immediate neighboring structures. For CRS purposes, the annual repetitive loss letter will continue to be mailed to the one property. Table 16-2 provides general information for the properties, along with mitigation measures that could be employed to address repetitive flood losses. For private properties, the decision on whether to implement the identified mitigation measures resides with the private property owner. These measures are recommended due to the flood risks, but owners are not obligated to implement them. The 2025 assessment aligns with the 2018 RLAA for potential mitigation actions.

Table 16-2. All Properties in Phoenicia-3 Repetitive Loss Area

Property ID	Number of Insurable Buildings	Building Description		Probable Mitigation Measures
		Foundation	Condition	
P-114	1	Basement	Excellent	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education
Total	**1**			

Figure 16-1. Subarea – Phoenicia-3 Repetitive Loss Area



17. SUBAREA – MT. TREMPER-1 REPETITIVE LOSS AREA

17.1 PROBLEM STATEMENT

Repetitive loss area SRLA-9 encompasses several parcels between Miller Road and Route 28. The area begins at the intersection of Route 28 and Miller Road and travels about 375 feet along Miller Road and about 225 feet along Route 28. The repetitive loss area is mostly covered by the new repetitive loss area boundary based on the 100-year floodplain.

Figure 17-1 shows the Mt. Tremper-1 Repetitive Loss Area, 2017 FEMA Effective DFIRMs, and building footprints of structures located in the area. The targeted repetitive loss property for this area is located within the floodplain. The property is in Zone A, which has significant risk from a 100-year flood. Repetitive riverine flooding caused by overbank flooding from the Beaver Kill. The 2025 assessment aligns with the 2018 RLAA for potential mitigation actions.

17.2 IDENTIFIED REPETITIVE LOSS PROPERTY

Table 17-1 lists the FEMA-designated repetitive loss property within this repetitive loss area.

Table 17-1. Repetitive Loss Properties in Mt. Tremper-1 Repetitive Loss Area

FEMA RL #	RL Map #	Flood Dates of Previous Claims	Average Claim Paid	Mitigated?
166733	4	12/17/2000; 6/26/2006; 8/28/2011	$47,575	No

Identified Flood Cause: Property is located in the floodplain. Repetitive flooding possibly caused by riverine flooding when storm flows exceed the capacity of the Beaver Kill and stormwater runoff from the hillside. No reported losses since 2011.

17.3 PROPERTIES INCLUDED IN REPETITIVE LOSS AREA

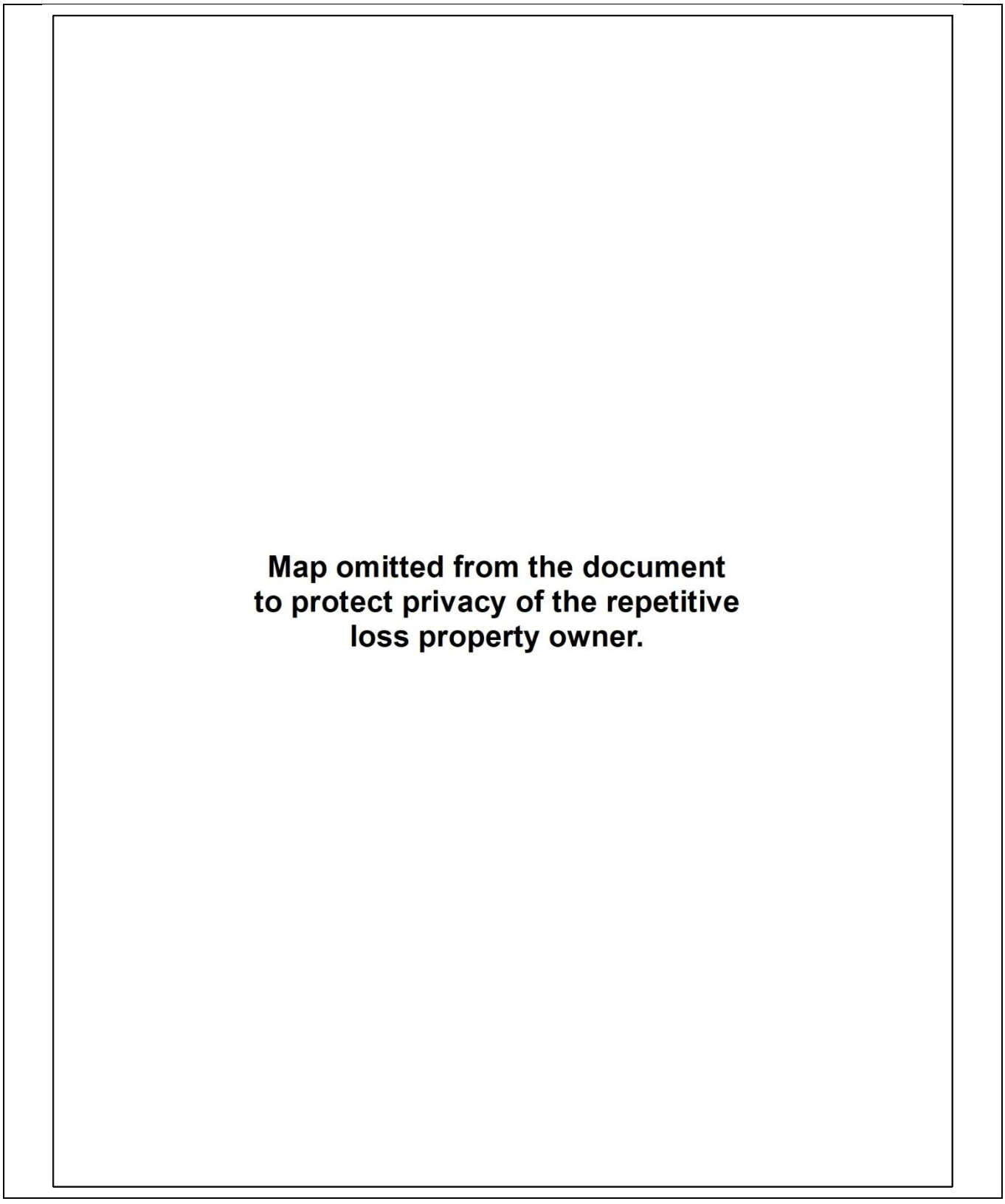
The repetitive loss Map #4 property is the only property included in this repetitive loss area. It has one insurable building and no immediate neighboring structures. For CRS purposes, annual communication is mailed to the one property within this area. Table 17-2 provides general information for the properties, along with mitigation measures that could be employed to address repetitive flood losses. For private properties, the decision on whether to implement the identified mitigation measures resides with the private property owner. These measures are recommended due to the flood risks, but owners are not obligated to implement them. The 2025 assessment aligns with the 2018 RLAA for potential mitigation actions.

Table 17-2. All Properties in Mt. Tremper-1 Repetitive Loss Area

Property ID	Number of Insurable Buildings	Building Description		Probable Mitigation Measures
		Foundation	Condition	
MT-1	1	Crawlspace	Normal	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education

Property ID	Number of Insurable Buildings	Building Description		Probable Mitigation Measures
		Foundation	Condition	
Total	1			

Figure 17-1. Subarea – Mt. Tremper-1 Repetitive Loss Area



18. SUBAREA – MT. TREMPER-2 REPETITIVE LOSS AREA

18.1 PROBLEM STATEMENT

Repetitive loss area SRLA-10 encompasses the area just south of the intersection of Route 28 and Route 212 and travels north along Route 28 until the road crosses Esopus Creek. The area also runs about 650 feet along Route 212. The repetitive loss area is mostly covered by the new repetitive loss area boundary based on the 100-year floodplain.

Figure 18-1 shows the Mt. Tremper-2 Repetitive Loss Area, 2017 FEMA Effective DFIRMs, and building footprints of structures located in the area. The targeted repetitive loss property for this area is located within the floodplain. The property is in Zone A, which has significant risk from a 100-year flood. Repetitive riverine flooding caused by overbank flooding from the Esopus Creek. The 2025 assessment aligns with the 2018 RLAA for potential mitigation actions.

18.2 IDENTIFIED REPETITIVE LOSS PROPERTY

Table 18-1 lists the FEMA-designated repetitive loss property within this repetitive loss area.

Table 18-1. Repetitive Loss Properties in Mt. Tremper-2 Repetitive Loss Area

FEMA RL #	RL Map #	Flood Dates of Previous Claims	Average Claim Paid	Mitigated?
196089 *SRL	5	1/19/1996; 12/17/200; 4/2/2005; 1/25/2010; 10/1/2010; 12/1/2010; 8/27/2011	$37,325	Yes

Identified Flood Cause: Property is located in the floodplain. Repetitive flooding possibly caused by riverine flooding when storm flows exceed the capacity of the Esopus Creek. No reported losses since 2011.

18.3 PROPERTIES INCLUDED IN REPETITIVE LOSS AREA

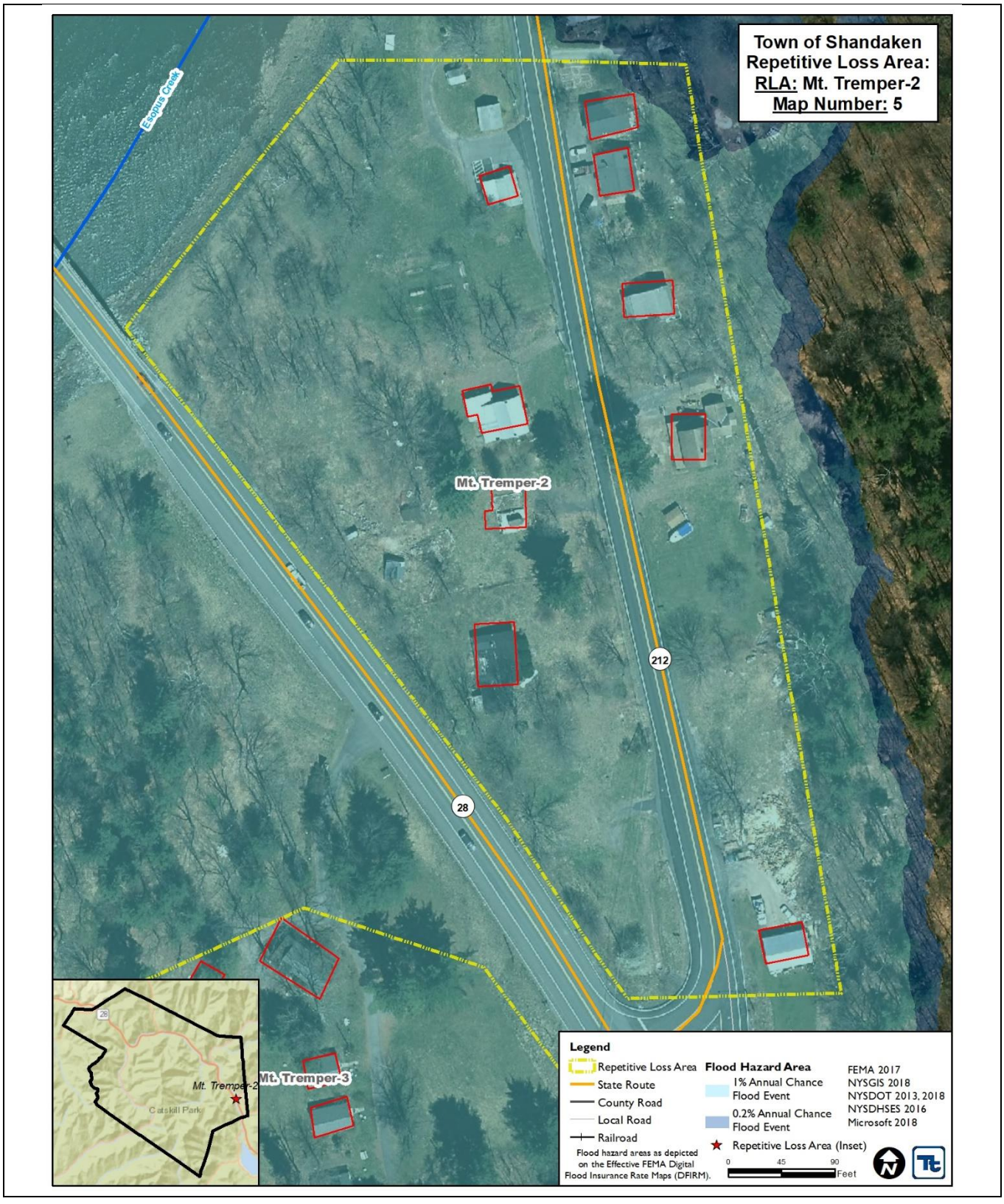
The repetitive loss Map #5 property is the only property included in this repetitive loss area. It has eleven insurable buildings. Table 18-2 provides general information for the properties, along with mitigation measures that could be employed to address repetitive flood losses. For private properties, the decision on whether to implement the identified mitigation measures resides with the private property owner. These measures are recommended due to the flood risks, but owners are not obligated to implement them.

Table 18-2. All Properties in Mt. Tremper-2 Repetitive Loss Area

Property ID	Number of Insurable Buildings	Building Description		Probable Mitigation Measures
		Foundation	Condition	
MT-2	1	Slab	Normal	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education
MT-3	1	Slab	Normal	FEMA Buyout – Structure demolished

Property ID	Number of Insurable Buildings	Building Description		Probable Mitigation Measures
		Foundation	Condition	
MT-4	1	Basement	Normal	Mitigation status – pending New York City funded buyout; structure to be acquired and demolished
MT-5	1	Basement	Normal	Mitigation status – to be mitigated by 2021 due to planned Route 28 bridge reconstruction project
MT-6	1	Basement	Good	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education
MT-7	1	Basement	Good	Mitigation status – to be mitigated by 2021 due to planned Route 28 bridge reconstruction project
MT-8	1	Basement	Good	Mitigation status – to be mitigated by 2021 due to planned Route 28 bridge reconstruction project
MT-9	1	Slab	Normal	FEMA Buyout – Structure demolished
MT-10	1	Crawlspace	Normal	FEMA Buyout – Structure demolished
MT-11	1	Slab	Poor	Structure relocated upslope and out of the SFHA and Repetitive Loss Area
MT-12	1	Slab	Normal	Structure demolished; new construction will be built to code
Total	**11**			

Figure 18-1. Subarea – Mt. Tremper-2 Repetitive Loss Area



19. SUBAREA – MT. TREMPER-3 REPETITIVE LOSS AREA

19.1 PROBLEM STATEMENT

Repetitive loss area SRLA-11 encompasses the area between Esopus Creek and Route 28. The area starts about 460 feet south of the Route 28 bridge over the Esopus Creek and runs until 475 feet north of the intersection of Route 28 and Hudler Road. The repetitive loss area is mostly covered by the new repetitive loss area boundary based on the 100-year floodplain.

Figure 19-1 shows the Mt. Tremper-3 Repetitive Loss Area, 2017 FEMA Effective DFIRMs, and building footprints of structures located in the area. The targeted repetitive loss property for this area is located within the floodplain. The property is in Zone A, which has significant risk from a 100-year flood. Repetitive riverine flooding caused by overbank flooding from the Esopus Creek. The 2025 assessment aligns with the 2018 RLAA for potential mitigation actions.

19.2 IDENTIFIED REPETITIVE LOSS PROPERTY

Table 19-1 lists the FEMA-designated repetitive loss property within this repetitive loss area.

Table 19-1. Repetitive Loss Properties in Mt. Tremper-3 Repetitive Loss Area

FEMA RL #	RL Map #	Flood Dates of Previous Claims	Average Claim Paid	Mitigated?
211748	6	9/29-10/1/2010; 8/28/2011	$33,144	No
211888	6	12/1/2010; 8/28/2011	$15,735	Yes
103629	6	1/9/1996; 9/17/1999; 4/3/2005; 6/26/2006; 4/16/2007; 9/29-10/1/2010; 8/28/2011	$23,869	Yes

Identified Flood Cause: Property is located in the floodplain. Repetitive flooding possibly caused by riverine flooding when storm flows exceed the capacity of the Esopus Creek. No reported losses since 2011.
Note: RL #196453 and 196493 were not used in the delineation of the area.

19.3 PROPERTIES INCLUDED IN REPETITIVE LOSS AREA

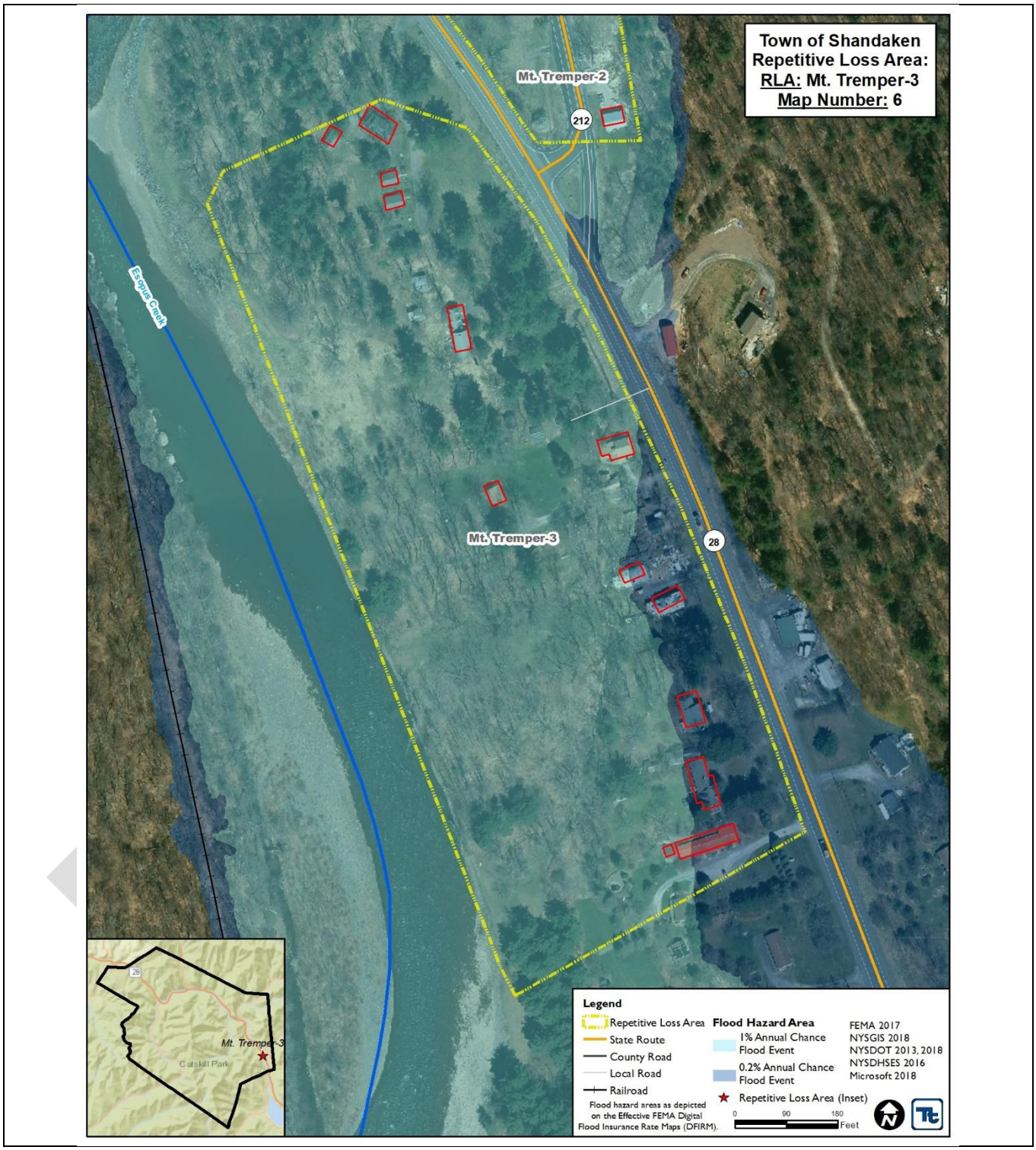
The repetitive loss Map #6 property is the only property included in this repetitive loss area. It has ten insurable buildings. Table 19-2 provides general information for the properties, along with mitigation measures that could be employed to address repetitive flood losses. For private properties, the decision on whether to implement the identified mitigation measures resides with the private property owner. These measures are recommended due to the flood risks, but owners are not obligated to implement them.

Table 19-2. All Properties in Mt. Tremper-3 Repetitive Loss Area

Property ID	Number of Insurable Buildings	Building Description		Probable Mitigation Measures
		Foundation	Condition	
MT-13	1	Basement	Normal	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education
MT-14	1	Slab	Normal	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education
MT-15	1	Slab	Normal	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education
MT-16	1	Slab	Normal	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education
MT-17	1	Basement	Normal	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education
MT-18	1	Basement	Normal	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education
MT-19	1	Slab	Normal	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education
MT-20	1	Slab	Normal	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education

Property ID	Number of Insurable Buildings	Building Description		Probable Mitigation Measures
		Foundation	Condition	
MT-21	1	Basement	Normal	Drainage System Maintenance or Enhancements Acquisition Structural Elevation Elevate Utilities Public education
MT-22	1	Slab	Normal	FEMA Buyout
Total	**10**			

Figure 19-1. Subarea – Mt. Tremper-3 Repetitive Loss Area



APPENDIX A: ADOPTION RESOLUTION

RESOLUTION XXX-XX **OFFERED BY:**

ADOPTING THE TOWN OF SHANDAKEN REPETITIVE LOSS AREA ANALYSIS UPDATE

WHEREAS the Town of Shandaken participates in the National Flood Insurance Program (NFIP) and the Community Rating System (CRS); and

WHEREAS CRS Activity 510 Floodplain Management Planning provides credit for preparation and adoption of a Repetitive Loss Area Analysis (RLAA) to reduce flood risk to repeatedly flooded properties; and

WHEREAS the Town of Shandaken caused an RLAA titled "The Town of Shandaken Repetitive Loss Area Analysis 5-Year Update" to be prepared, documenting outreach, site investigations, alternative mitigation measures, and findings; and

WHEREAS the governing body has reviewed said RLAA and finds that it advances public safety and welfare by identifying practicable mitigation actions;

NOW THEREFORE, BE IT RESOLVED THE TOWN OF SHANDAKEN by the Town of Shandaken that:

1. The 2025 Repetitive Loss Area Analysis is hereby adopted as the official planning document for addressing repetitive flood losses within a jurisdiction.
2. The [Floodplain Administrator/Town Administrator/Supervisor] is authorized and directed to implement the RLAA's action items, pursue funding, and coordinate with county, state, and federal partners.

MOVE ITS ADOPTION

Seconded by:

	ROLL CALL AYES	NAYS
BOARD MEMBER [INSERT NAME]	____	____
BOARD MEMBER [INSERT NAME]	____	____
BOARD MEMBER [INSERT NAME]	____	____
BOARD MEMBER [INSERT NAME]	____	____
SUPERVISOR [INSERT NAME]	____	____

APPENDIX B: GENERAL FLOODPLAIN LETTER TEMPLATE

APPENDIX C: MEETING DOCUMENTATION

Ashokan Watershed Stream Management Program

Repetitive Loss Area Open House & Survey

Date: August 25, 2025

NAME	ORGANIZATION	PHONE	EMAIL
Heidi Emrich	UCDOE/AWSMP	845-340-3522	hemrece.ulster.ny.us
Peter DiSclafani	T/O Shandaken	845 688 7165	supervisor@shandaken.gov

APPENDIX D: SURVEY RESULTS

APPENDIX E: AGENCY CONTACT RECORDS